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HYSTERICAL PARALYSIS AND ITS TREATMENT

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Hysteria, like many another concept of medicine, is a fusion of conditions that resemble but are not identical with one another. From the hysterical state that is a total alteration of personality to the case in which hysterical manifestations appear as a sort of foreign body in the personality is a wide gap, which extends from an innate or constitutional disorder to an easily curable condition.

The group of cases here presented have a physiology or, at any rate, a physiologic psychology which, once understood, opens the doors to a rapid cure. But unless their mechanism of disability is understood the patients may be markedly incapacitated and wander from physician to physician vainly seeking help. In other words, a superficial pathologic condition blocks the normal conduct reactions of the individual as thoroughly as the deeper lying disorder in those cases in which hysteria is really a psychosis demoralizes the individual.

The first cases of this group make up a sample wherein there is disturbance in the flow of muscular power which constitutes the so-called hysterical paralysis. Something occurs, either accident, injury or disturbing emotional state, by which a part becomes immobilized for a time. In its genesis the paralysis represents what I here call the hysterical amnesia for the proper interaction of muscles to produce motion. More simply, there is a sort of forgetting of the mechanism of successful motion and a substituted disorder, which produces paralysis.

REPORT OF CASES

CASE 1.—K. W., a man, aged 22, single, a salesman, whose early history was entirely negative for neurotic or hysterical manifestations, was playing football eight weeks before being seen and was knocked unconscious for one and one-half hours and was hazy the next day. In the hospital to which he was taken, it was stated that there was a fracture of the first lumbar vertebra. He stated that both legs felt paralyzed and anesthetic at first. The anesthesia of both legs remained for some time; then that of the left entirely disappeared and the right improved but had remained more or less anesthetic ever since. He was unable to use the right leg, although the left leg had entirely recovered. The right leg was "numb" as well.

Physical examination was entirely negative except for the right leg. The knee jerks on both sides were lively and equal. Ankle jerks were lively and equal. There was no Babinski reflex. There was almost complete anesthesia below the right knee. The anesthesia ran circularwise around the leg in typical hysterical fashion. As he attempted to lift the leg, the muscles on both sides of the thigh contracted violently; that is, the quadriceps contracted vigorously, as did the flexors. The toes were moved but slightly. The wrong flow of power was distinctly evident; that is to say, when the attempt was made to raise the leg from the table, the agonist and antagonist were contracted. This set up a deadlock between the two groups of muscles and, naturally, motion became impossible.

The immediate psychogenesis of the situation seems simple enough. There was undoubtedly some cord injury at first, which set up a numbness of the legs and weakness. This disappeared but left behind it a state of fear and one of amnesia for the proper use of the muscles of the legs. This condition was explained to the patient. He was told that he would be able to walk when he left the office. A powerful electric current was given to the muscles of the front of the leg. They contracted vigorously. This continued for a few minutes. The patient was told to watch the muscles contract, and it was stated to him that he must try to help the electric current and contract the muscles with each stimulation. In a short time the current was discontinued surreptitiously, and the patient continued to move his leg with no electrical stimulation. Shortly thereafter he was able to move his leg perfectly well and walked out of the office with no drag whatever to his leg.

CASE 2.—K. B., a housewife, aged 44, was one of a group of patients in whom "medicolegal trauma" operated as the initiation of a hysteria. The usual claim that in a case in which litigation is proceeding a cure cannot be effected while the litigation is going on is upset by this case. Three years before, the patient was in an accident and suffered severe injury to the leg, especially around the patella. The leg was painful and stiff; there was an injury to the cartilage. A year afterward a cartilage was removed from the left knee. Since that time the leg had been held rigid and there had been no power of extension or flexion at the knee. She had walked about, dragging this leg. The question of operation had now come up, since the situation had not improved, despite physical therapy of an extensive and persistent type. At the time of the accident the patient injured the left arm, but this member had almost completely recovered, although there was some numbness and tingling. The patient struck her head at the time of the accident and had headaches and dizziness even at the time of examination. However, the main complaint concerned the left leg.

The patient walked without extending or flexing the left knee, and there was little motion at the left hip. However, there was very little atrophy of the left thigh. Both knee jerks were equal, although the left required reinforcement for its appearance. When reinforcement was used, it was equal to that of the right side. When the leg was held up and the thigh supported, the knee dropped. However, it was noticed that when this happened the hamstrings contracted and assisted gravity in pulling the leg down. There was absolutely no power to extend the leg voluntarily at the knee. There was some power to extend the leg at the hip; that is, when the entire leg was supported and the patient was urged to do so, she could flex the thigh on the abdomen. There was no general loss of sensation, although there was an absence of tickle reaction on the sole of the left foot. Further examination showed that, when the effort was made to extend the leg, the hamstrings contracted while the quadriceps did not. On this basis, namely, that the antagonists were called into play rather than the agonists, a diagnosis of hysteria was made and the patient was advised as to the situation, reassured that the condition was entirely curable, and the rather bold statement was made that she would not be allowed to go home until she used the left leg as well as the right.

The electric current was tried but had no value in this case. Although the muscles contracted vigorously with the galvanic

current and she experienced definite pain, she was still unable to use the leg voluntarily. Another technic, therefore, was used, based on the following observation: Ordinarily, when the leg is flexed at the hip on the abdomen, the quadriceps is thrown into associated activity in an involuntary but synergic fashion. Therefore, the patient was instructed to flex the hip vigorously. After a while she did this, and it was then noted that the quadriceps contracted and the leg, when the support of the physician's hand was removed, did not drop immediately or rapidly to the table. The patient's attention was called to this, and she saw for the first time that there was power in the quadriceps of the leg. The flexion of the hip was repeated fifteen or twenty times, after which the quadriceps was contracting vigorously. She was then able to hold the leg off the table. With the continuance of this exercise, the patient's will obtained control of the quadriceps muscle and in half an hour after the treatment was commenced she was using the leg as well as ever and performed all the motions without the flow of the effort into the hamstrings but properly into the muscles normally utilized for the motion.

It is noteworthy that when the power first returned to the quadriceps there was a marked coarse tremor of that muscle. This disappeared, and the patient has remained well since.

CASE 3.—A youth, aged 16 years, a strong and powerfully built boy, twisted his back, Sept. 19, 1934, while playing football. He had pain at this time but felt well, continuing to play football until September 25, when he had severe pain in the front of the body near the pelvis and running up the abdomen. He quit playing football. The pain was so severe that he took to bed and had remained there ever since. At first he had a temperature of 101 F., with rigidity of the abdominal muscles. The bowels were constipated. The temperature dropped in a day or two, and a roentgenogram at the hospital showed a separation of the symphysis. Since that time he had been in bed except to go to the bathroom, and this he did with much assistance and much dragging and scuffling of the feet.

He was examined by a surgeon, who found no orthopedic abnormality and who referred him for neurologic study. He was a large boy and was supported by others when he walked; he dragged both legs. There was very slight flexion of the thigh on the hip, slight extension of the leg on the thigh, and foot-drop on both sides. The cranial nerves and the arms were entirely intact. Thorough examination of the legs revealed no organic neurologic signs. When he attempted to move the legs, the muscles were thrown into a coarse tremor. The muscular exertion seemed powerful, but it was obvious that the agonist and the antagonist were being contracted at the same time. There were no sensory disturbances of any type.

It was explained to him that his entire condition was due to fear; that he would be able to walk if he put himself into a calm frame of mind regarding his condition, and that the separation of the symphysis, of which he had been informed, was of no practical consequence. Rapid passive motions were made, and he was asked to cooperate as best he could. After a dozen or more such passive motions had been made the leg was suddenly released, and it was found that he was using his leg with force and precision. From motions while on his back, instruction was continued while the patient was on his feet. There was a remarkably quick transition from helplessness to perfect control of motions of the legs, so that he walked out of the office without any difficulty whatever.

In this particular case the mechanism seems to have been first pain, then fear, and as a resultant of the psychologic situation a physiologically wrong innervation of the muscles of the legs. The correction was a simple matter of encouragement, instruction and some trickery. (I have labeled this trickery "legitimate hocus-pocus.")

CASE 4.—A housewife, aged 35, also demonstrates that traumatic hysteria may be genuine and that the patient suffering from such a condition may make an honest effort to get well. The patient was seen Dec. 5, 1934. A year before she was in an automobile accident. The car in which she was riding tipped over and all the passengers fell out in a heap. She was not rendered unconscious but was shaken, bruised and cut. She was out of bed in two days but noticed that the right arm commenced to shake. This continued, grew worse, and reached the stage at which she could not use the hand for writing or for any of the ordinary purposes, so that she has been compelled to do most of her work with the left hand. Shortly afterward it was noticed that there was side-to-side, rotatory shaking of the head. There was no pain. Her sleep was poor; she tired easily. At times she became generally shaky.

She was sturdy and well developed. There was at times a rotatory lateral tremor of the neck and head. This often disappeared but generally was quite conspicuous. The right arm, when extended, showed marked tremor, and this was quite extreme in the finger-to-nose test. The left arm showed a very slight tremor. Reflexes of the arms were equal and active. There was no apparent tremor of the right leg. Motions of the legs were intact. Reflexes of the legs were somewhat hyperactive and equal. There were no pathologic toe signs. There was a very marked midline right-sided diminution of sensation throughout, including the face, palate, right eye, right nostril, mucous membrane of the mouth and the right side of the chest and abdomen, including one half of the vagina and the entire right leg. The abdominal reflexes were normal. The visual field that concerned the right eye was diminished throughout; that which concerned the left eye was normal. It was also noted that the tremor of the arm depended on the overuse of the muscles concerned with motion. Any one can create a tremor of his arm who will overcontract the muscles of action, especially if he contracts the antagonists at the same time. There was some doubt as to whether this was not a case of multiple sclerosis, but the general alinement of symptoms and signs finally indicated that it was hysteria.

The treatment here was first to change the anesthesia of the right side into normality by the use of the strong galvanic current; after the use of this current on a few occasions, the anesthesia disappeared. With relaxation exercises, together with the judicious use of stramonium, the tremor disappeared, and six months later there was only a slight amount present.

There is no satisfactory explanation of the fact that half of the body disappears from consciousness so far as skin sensation is concerned. There is, of course, a numbness of the hands or any part of the body experienced under violent emotion, and it may safely be said that in the mechanism of emotional injury is the superficial explanation of hysterical anesthesia. The electric current was used merely to "recall" the part into consciousness. This it succeeded in doing. The tremor was obviously due to the wrong use of muscles. When this was corrected, the tremor disappeared.

The next two cases concern situations that were so deeply rooted in the entire attitude of the patients that any ordinary approach, as involved in suggestion, explanation or the use of electric currents, was unavailing. Consequently, a more radical attack was instituted.

CASE 5.—G. K., a young man working as a laborer, felt a sharp pain in his back while doing some heavy work lifting. It happened that he was working for himself and, consequently, there was no medicolegal situation involved and therefore no "compensation neurosis." However, the pain increased to the point at which he became entirely incapacitated, and his back assumed a marked flexed position and the body was rotated somewhat to the left. He was in one of the important hospitals of Boston for about six weeks. Roentgenologic studies were instituted with the result that nothing organic was found, after which interest in him lapsed. A few efforts were made psychotherapeutically to encourage him to get up, with no results of importance. He was taken home and had been in bed some three months entirely helpless when he was seen.

He was a stalwart young man and lay in bed, more or less curled up, the legs flexed on the abdomen, the back held rigid by contracture of the long muscles, which stood out like whipcords and which could not be relaxed by persuasion, pleading or suggestion. It was then explained to him that he was holding his back rigid more through pain and fear than through any organic situation. It was suggested that he take some ether; he was told that the muscles would be relaxed under ether; that when he "came to" he would be walking without trouble and without pain. His wife was instructed to assure

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him that this would be the result until the therapeutic anesthesia was to be given the next day. At the time appointed, he was anesthetized to the state just beyond primary ether. The muscles were entirely relaxed; the back became entirely straight. An assistant put him on his feet and held him in an erect position. He was then marched to and fro by the assistant and the patient's wife. At the same time I spoke to him encouragingly, telling him that the pain was gone and that he was able to walk. As the ether wore off and consciousness returned, he found himself walking to and fro in an erect posture. As consciousness became clear, he discovered to his surprise that his back was free and flexible and that he was able to bend and to walk in a normal fashion.

The patient was seen three years later. At this time he had pain in his back as a result of his work. This pain was declared by a competent orthopedic surgeon to be due to a sacro-iliac condition, for which he continued to have treatment for a long time. There was, however, no distortion of the back and no hysteria at this time.

CASE 6.—W. H., a man, aged 43, single, of high scholastic attainments and a professor in a great university, presented perhaps the most interesting case of this series. The personality of this man is one that markedly deviates from the ordinary. He had a boyhood and youth of extreme struggle and great devotion to learning, a devotion that led through the garret type of existence to a chair in a university. He is a solitary man, entirely celibate, but undoubtedly his inner life is not so placid as his actions would lead one to believe.

About fifteen years ago he had a neurosis which was associated with difficulty in swallowing. This difficulty never reached an extreme grade and after an extended rest he recovered, at least outwardly. His career continued and from time to time he had slight recurrences, which ran the following general course: There was first a loss of appetite with general anxiety, sleeplessness and fatigue. There developed fear of choking which, to some extent, was traceable to his excursions into psychiatric literature; then there appeared an inability to pass the food beyond the mouth, and finally the disappearance of the ability to swallow solid food and a marked difficulty in the swallowing of liquids.

When he was seen, July 10, 1931, he had already been sick some six weeks. The attack was the worst he ever had. He had lost weight, although the anxiety had disappeared and he was sleeping fairly well, but the difficulty in swallowing had become quite central in the symptomatology and had reached the point at which a crisis had developed. "In swallowing he puts the fluid in his mouth; the tongue then gets in the way; he puts his head forward, gulps, strains, chokes, and in a considerable period of time manages to swallow part of a mouthful. By dint of considerable application and concentration he manages to do away with two or three glasses of milk a day at the expense of a large part of his time."

He was unable to receive treatment from the neurologist who cured him in his first major neurosis. He visited a psychoanalyst, who told him that it would take a long time to be psychoanalyzed and, consequently, he had better seek some other type of treatment because of the nutritional emergency. He was sent to a hospital. An effort was made to increase his appetite by bitter tonics and by exercise, but no real or substantial change took place. It was then decided that, if the fear of swallowing could be displaced for a short time so that automatic swallowing could take place, he would recover.

The only approach to this end seemed to be through anesthesia. There were two treatments given. Prior to the first, he was informed that on the following day he would be given anesthesia in a mild form; that when he recovered consciousness, he would be able to swallow liquids without any trouble whatever. The next day he was given nitrous oxide. As he became unconscious, a glass of milk was put to his mouth. As he started to recover consciousness, he was instructed in peremptory fashion to drink. He did this, drinking quite freely and by the time he recovered complete consciousness he found himself drinking with freedom and without any difficulty whatever. He continued to drink without any trouble thereafter. Three days later the experiment was repeated, except that he was assured that he would find himself eating solid food. By this time he was quite prepared to believe that this would be the case. When the mask was removed, a sandwich was handed to him. He was enjoined to eat it and the meal was finished by the adjournment of the physician, the assistant and the patient to a restaurant where all three had a hearty meal, the patient eating with as much dexterity as the others.

In the four years that has elapsed the man has continued to be well. There has been no recurrence of the difficulty. Whatever deep and dynamic complexes are at work in his subconsciousness, they have not interfered with his success, and whatever rôle they may have played in the difficulty of eating and drinking has also disappeared back into the unconscious.

Superficial as the treatment may have been, results were excellent. Moreover, this man is not the type who would yield himself to a psychoanalysis or any other intimate form of self revelation. His whole instinct is to hide his intimate feelings from the scrutiny of others. His solitariness is, in large measure, conditioned by this phase of his psychologic make-up. He continues to be a valuble member of society despite his shut-in personality. Probably it is better for scholarship and culture that he continues to manifest this peculiarity, since his singular excellence is probably dependent on his escape from the distractions of society.

COMMENT

These cases are undoubtedly of the kind that make up the roster of miracles, by which healers, saints and shrines build up their reputation. They are here recorded to show that the pathologic condition disappears when the symptoms are explained physiologically and the therapeutics is rationally directed.

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THE HEMOLYTOPOIETIC EQUILIBRIUM AND EMERGENCY SPLENECTOMY

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Despite the mystery that has surrounded the spleen in the past, and the ignorance that still persists with reference to the exact nature and variety of its physiologic functions, two important activities are now definitely established as centering in this organ: one, the reservoir capacity for red and white blood cells;[1] the other, the phagocytic, destructive activity of the reticuloendothelial elements, the clasmatocytes of the splenic pulp, for old or injured erythrocytes,[2] granulocytes,[1f] and blood platelets.[3] Under physiologic conditions

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Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the authors' reprints. A copy of the latter will be sent by the authors on receipt of a stamped addressed envelop.

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there is maintained in health a nice balance between bone marrow hematopoiesis and these splenic functions of cell storage and cell death. To express succinctly this reciprocal relationship between the organs subserving these antithetical functions, Krumbhaar [4] proposed in 1923 the term "hemolytopoietic equilibrium."

It has been the experience in medicine that, whenever any physiologic function is recognized for any organ, a disease entity due to a corresponding pathologic dys-

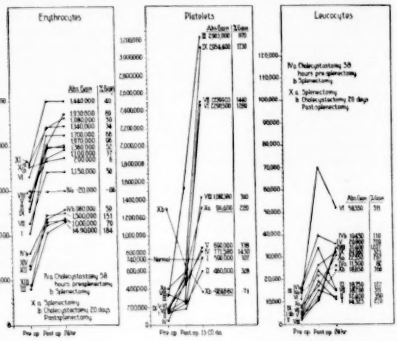

Chart 1.—Postsplenectomy cellular reactions in fourteen cases of congenital hemolytic jaundice.

function may be anticipated and sooner or later will be encountered. Specific clinical entities each involving a disturbance in one or more of the functions just mentioned for the spleen are known. In congenital hemolytic jaundice we recognize a simple dominant familial tendency for the erythroclastic functions of the spleen to become overemphasized to the point of clinical signs and symptoms. In certain types of purpura the thrombopenia may be of splenic origin. The leukopenia of Banti's and of Felty's syndromes is associated with splenomegaly. In each of these several pathologic states the surgical removal of the spleen in the more chronic stages of activity has resulted in clinical improvement coincident with the correction of the specific cytologic deficiencies involved.

Experience with splenectomy in the past, however, has led to the almost universal dictum that operative intervention is distinctly contraindicated in the presence of an acute splenic crisis.[5] It is our belief, on the contrary, that if the pathologic physiology of the spleen is adequately understood, and its relationship to the hemolytopoietic equilibrium recognized, splenectomy—emergency splenectomy if you please—is not only indicated in the more acute exacerbations but demanded as a life saving measure, whether the hemoclastic crisis is of spontaneous or of precipitated origin, and irrespective of the severity of the anemia that may develop.

During the past five years our clinical investigation of diseases involving the spleen has resulted in advising and in consummating splenectomy in thirty-one cases. In each instance careful and thorough laboratory studies were made the basis for differential diagnosis and for an attempted appraisal of the hemolytopoietic equilibrium, preliminary to, during, and subsequent to removal of the spleen. Seventeen of the cases represented a variety of syndromes—thrombopenic purpura, Banti's disease, hypoplastic anemia, leukanemia (persistent extreme splenomegaly after two and one-half years of medical treatment), chronic myeloid and lymphoid leukemia (with intestinal obstruction from splenic tumor), and polycythemia vera (with cirrhosis and repeated hemorrhages from esophageal varices). The details of these cases will be presented elsewhere. The indications for removal of the spleen in each individual in this group we believe to have been valid, but in some instances, as parenthetically suggested, the cure of the principal underlying disease was not the basis for operating. The operative mortality in this group was five, three of the fatalities being far advanced cases of Banti's syndrome; two patients with early Banti's disease survived splenectomy and have been greatly benefited by the procedure up to the present writing. The technical difficulties of splenectomy in advanced Banti's disease suggest reliance on ligation of the splenic artery as the procedure of choice if operative intervention is necessary.

Fourteen splenectomies were performed with no operative deaths in patients with a readily established diagnosis of congenital hemolytic jaundice. In this second group, removal of the spleen was accomplished in four patients during a quiescent interlude of the disease as a prophylactic procedure; in five patients, operative intervention was decided on during a subacute

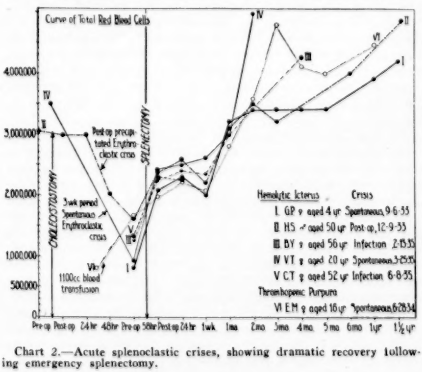
Curve of Total Red Blood Cells
CHOLECYSTOSTOMY
SPLENECTOMY
Hemolytic Icterus Crisis
I GP ♀ aged 4 yr. Spontaneous, 9-6-35
II HS ♂ aged 50 yr. Post op., 12-9-35
III BY ♀ aged 56 yr. Infection 2-15-35
IV VT ♀ aged 20 yr. Spontaneous, 3-25-35
V CT ♀ aged 52 yr. Infection 6-8-35
Thrombopenic Purpura
VI EM ♀ aged 16 yr. Spontaneous, 6-28-34

Chart 2.—Acute splenoclastic crises, showing dramatic recovery following emergency splenectomy.

exacerbation of the hemolytic process, and in five critically ill patients the spleen was removed as an emergency procedure with the total red count rapidly approaching or actually under 1,000,000 cells per cubic millimeter in a fulminant, acute, hemoclastic crisis. While the evidence on which our decision to advise operation during the acute stage of an erythroclastic crisis was obtained from a careful study of the changes induced immediately following splenectomy in the more

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chronic phases of the disease [6] (chart 1), we shall limit this discussion to the results of emergency splenectomy, the more sharply to emphasize the spectacular hematologic and clinical recoveries (chart 2) that at times follow speedily on the removal of this organ, and at the same time to point out the grave dangers to life which exist when the spleen begins to exert an excessive destructive action on any of the circulating elements of the blood and/or an undue inhibitory effect on bone marrow hematopoiesis.

Much discussion continues to center about the relative rôles of spleen and bone marrow in certain hematocytopenic states. In those deficiency states of the blood entirely unrelated to the spleen, the removal of this organ is not only useless but definitely contraindicated. The most meticulous differentiation of underlying mechanism in each case must therefore precede the outlining of any rationale of therapy. Our emergency splenectomies, i. e., those performed with the total red count near the 1,000,000 level, have been limited to patients with congenital hemolytic jaundice, to selected instances of thrombopenic purpura, and to certain cases of hypoplastic anemia. In the first condition we believe that the spleen is the primary seat of the pathologic condition; in the latter two, the splenic influence may represent an important factor in the existing cellular disequilibrium.

HEMOLYTIC JAUNDICE

The sensitiveness and lability of the "zonal" cellular variations from moment to moment, as revealed in carefully controlled, frequently repeated, counts of the peripheral blood elements, were established some years ago [8] and have been repeatedly confirmed. As a consequence, in our first studies of clinical cases of chronic congenital hemolytic jaundice [6] daily estimations of the various cell levels were made for periods of three months or longer to establish thoroughly the range of fluctuation existing before operative intervention was undertaken. Then on the day of operation blood studies were made at fifteen minute to half hourly intervals throughout the day, with the astonishing discovery that instead of the erythrocyte increase, as described in the literature, coming in from one to three months following the removal of the spleen, a major increase, frequently of 1,000,000 or more red blood cells per cubic millimeter, occurred immediately—before the patient left the operating table, irrespective of the preoperative level of the total red cells. This phenomenon was observed not occasionally or sporadically but regularly, whenever sufficient hematologic studies were made (chart 1). Hemoglobin, hematocrit, leukocytes and thrombocytes likewise rose promptly in sufficient magnitude, coincident with a dramatic clinical improvement, to suggest strongly an absolute increase in available circulating elements rather than a concentration phenomenon of the plasma only. A progressive decrease in icterus index and reticulocytes, which always follows removal of the spleen in hemolytic jaundice, reflected the elimination or subsidence of the hemolytic process. Moreover, the gradual return of the red cells to a more nearly normal diameter and volume, and the increase to a more nearly normal range of their resistance to hypotonic saline solution seemed to be evidence of the increased efficiency of the bone marrow in the absence of splenic influence. In short, the data obtained suggested that the epinephrine stimulated and manipulatively induced disgorgement of the sequestered blood cells from the splenic reservoir incident to operation, and the sudden elimination of the destructive activity of the splenic phagocytes renders more effective the unusually active erythrocyte delivery and erythropoiesis that characterize the bone marrow in hemolytic anemia. Subsequent blood volume studies have established beyond question the validity of these first assumptions.

The gradual accumulation of such facts as have been cited formed the background for a growing conviction that, given proper medical judgment and adequate surgical management, the patient in acute erythroclastic crisis should respond even more dramatically and promptly to the surgical removal of the spleen than those patients seen in the subacute and chronic phases. The first test of this hypothesis came in a little girl:

CASE 1 (chart 2).—G. P., a girl, aged 4 years, during the month of August 1933 became gradually less active, fatigued easily, grew pale, then slightly icteric, and when finally seen by her physician had only 869,000 red blood cells per cubic millimeter. Despite intensive liver therapy, at the end of ten days the red count was only 600,000, the jaundice had increased, the spleen had become palpable, the peripheral lymph nodes were shotlike, and, a high leukocyte count being recorded, the diagnosis of acute lymphatic leukemia was made. In consultation, however, on careful laboratory study, we found the apparent elevation of the leukocyte count to represent for the most part nucleated red blood cells with little qualitative or quantitative deviation of the leukocytic formula from the normal. Approximately 100 per cent of the red blood cells were found to be reticulated, and a macrocytosis rather than the usual microcytosis existed in this child. The mother and the maternal grandfather, who were examined at once, both showed the laboratory stigmas of congenital hemolytic jaundice. The child was moribund. It was decided to give a small transfusion, since the jaundice was slight, indicative of liver efficiency in handling satisfactorily the increased pigment, and the renal function was apparently good. Following 200 cc. of the father's matched blood a temporary rise in the total red count to 900,000 occurred; however, within twelve hours the count again totaled only 660,000 and the hemoglobin 2 Gm. per hundred cubic centimeters. A second transfusion of 200 cc. from the original donor raised the count to 1,190,000, but twelve hours later the erythrocyte count was 810,000; the jaundice had perceptibly deepened; the spleen had definitely increased in size; the temperature was 101.8 F., pulse 120, respirations 30, systolic blood pressure 75, diastolic unobtainable. It was perfectly obvious that more transfusions were contraindicated; liver therapy had already been given a ten day trial by the first attending physician. The only possible hope lay in splenectomy, if the child could survive the ordeal. The courageous parents accepted this decision after a full explanation of the facts, and an emergency operation was performed at midnight by Dr. Verne Dodd, surgeon-in-chief, at the University Hospital, under nitrous oxide-oxygen-ether anesthesia. The spleen as removed weighed 212 Gm. Immediately prior to operation, at 11 p. m., the patient had a temperature of 101 F., pulse 112, blood pressure 98 systolic and 0 diastolic, total red cells 1,020,000, hemoglobin 3.7 Gm., reticulocytes 99 per cent, leukocytes 15,000. Immediately at the conclusion of the operation, at 1 a. m., the temperature was 101.6 F., pulse 132, blood pressure 106 systolic and 40 diastolic, total red cells 2,070,000, hemoglobin 6.0 Gm., leukocytes 34,000 with no immature myelocytes present, reticulocytes 89 per cent, erythrocyte fragility 0.707-0.412. Nine hours after the operation the reticulocytes had fallen to 68 per cent, at nineteen hours to 55 per cent and by the fourth day to 23 per cent, thereafter showing a gradual but steady decrease to within the limits for normal by the thirty-eighth postoperative day. The blood platelets rose from a preoperative level of

6. Doan, C. A.; Wiseman, B. K., and Erf, L. A.: Studies in Hemolytic Jaundice, Ohio State M. J. **30**: 493 (Aug.) 1934.

8. Sabin, F. R.; Cunningham, R. S.; Doan, C. A., and Kindwall, J. A.: The Normal Rhythm of the White Blood Cells, Bull. Johns Hopkins Hosp. **37**: 14 (July) 1925. Doan, C. A., and Zerfas, L. G.: The Rhythmic Range of the White Blood Cells in Human Pathological Leukopenic and Leukocytic States, with a Study of Thirty-Two Bone Marrows, J. Exper. Med. **46**: 511 (Sept.) 1927. Doan, C. A.: The Neutropenic State, J. A. M. A. **99**: 194 (July 16) 1932. Short, J. J.: Diurnal Variations in the Concentration of Red Blood Cells and Hemoglobin, J. Lab. & Clin. Med. **20**: 708 (April) 1935.

330,000 to 1,540,000 on the third postoperative day, to 2,400,000 on the tenth, and to 3,233,000 on the twenty-third; by the sixty-seventh day the platelets numbered 890,000, a high normal that has been maintained since. By the twentieth postoperative day the erythrocyte fragility range had fallen to 0.495-0.300 and at the end of one year to 0.471-0.300, a remarkable reduction from the original 0.707-0.412. At no time following the operation did the red cell level fall below 2,000,000 cells. The immediate release of increased red cells following the tying of the splenic pedicle was reflected clinically by the pink flush which suffused cheeks, ears and mucous membranes at the operating table. What two blood transfusions of 200 cc. each and much liver extract had failed to accomplish, the removal of the spleen consummated instantly. Chart 2 case 1 graphically depicts the erythrocyte curve for the first year and a half since splenectomy and this may be taken as an index of the patient's

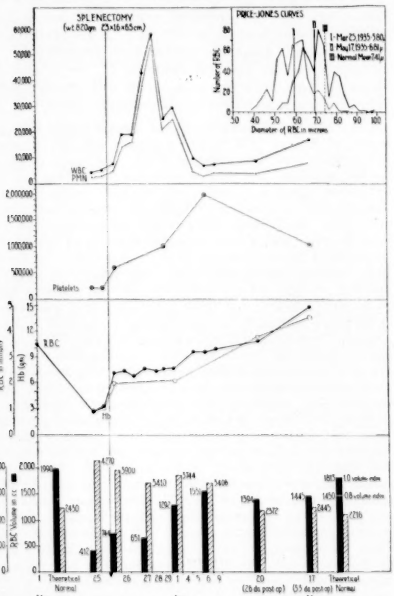

Chart 3 (case 2).—Congenital hemolytic jaundice: Spontaneous acute hemoclastic crisis with rapid recovery following emergency splenectomy.

continuing gain in appetite, weight, hemoglobin (now 13.5 Gm.) and every other physical and mental attribute.

The question as to the mechanism involved in the sudden release of erythrocytes following splenectomy led naturally to studies of the blood volume before and after operation. Case 2 is an example of one such study:

CASE 2.—V. T., a woman, aged 20, two of whose brothers we had seen previously in acute hemoclastic crises, was brought to the hospital in a semicomatose state, with marked cardiac murmur. It was at once evident that a profound anemia existed; there was a moderate degree of jaundice. Three weeks before the present episode the patient, while visiting her brother, who had undergone splenectomy for active congenital hemolytic jaundice, was examined and found to have a total erythrocyte count of approximately 3,500,000 cells. Laboratory studies on admission revealed a total red count of 900,000 cells, hemoglobin 2.9 Gm. (Newcomer), leukocytes 4,850, blood platelets 232,200, icterus index 27, reticulocytes 0.4 per cent, erythrocyte fragility 0.550-0.282, and mean erythrocyte diameter 5.80 microns. The supravital differential count was: neutrophils, 50 per cent; metamyelocytes, 2 per cent; lymphocytes: small, 18 per cent; intermediate, 8 per cent; large, 2 per cent; monocytes, 20 per cent. Despite the low reticulocyte percentage (in sharp contrast to the 100 per cent reticulocytes in case 1 under identical circumstances of spontaneous crisis with red cell count under 1,000,000), it was obvious that during the three weeks interval a spontaneous erythroclastic crisis had developed. The question of whether the bone marrow was exhibiting an exhaustion phenomenon in failing to respond with reticulocytes could be answered only by the therapeutic test. With the family trait established and the results of the laboratory and physical examinations as indicated, it seemed unwise to delay operation. The patient arrived at the hospital at 3 p. m. and by 9 o'clock was on the operating table. The laboratory data immediately before operation were essentially as already given for the admission studies.

Blood volume determination with vital brilliant red (chart 3) revealed an actual plasma volume of 4,270 cc. in contrast to a theoretical normal, calculated on the basis of body weight, of 2,430 cc. The estimated total packed cell volume on the basis of hematocrit readings (8 per cent) and determined plasma volume was 412 cc. as contrasted with a theoretical normal of 1,990 cc. Immediately following the removal of an 811 Gm. spleen the total red cells were found to have increased from under 1,000,000 to 2,400,000 per cubic millimeter, hematocrit from 8 to 17.8 per cent, hemoglobin from 3 to 6 Gm. (Newcomer), and total red cell volume from 412 to 744 cc.; the plasma volume had fallen slightly to 3,900 cc. The subsequent course of events may be readily followed from the detailed information contained in chart 3. By the twenty-sixth postoperative day the total red cell volume had reached 1,394 cc., which is within 50 cc. of the calculated normal if the microcytosis that existed is used as the basis for the calculations (chart 3).

From marble pallor to pink cheeks, lips and ears was a matter of minutes, and the roughness and intensity of the cardiac murmur over the entire precordium before operation had subsided almost to inaudibility by the time the patient was returned to her room. No remnant of auscultatory evidence of cardiac disturbance can now be made out in this patient. Blood volume studies on the fifty-eighth postoperative day showed the reestablishment of an entirely normal blood plasma-erythrocyte volume ratio to have been accomplished. The period of hospitalization was twenty-four days.

The importance of accidents and of medical illnesses as precipitating events in the accentuation of the hemolytic process in susceptible individuals is an established fact. It would be anticipated, therefore, that any major operative procedure necessitated in a patient harboring the congenital icterus trait might well precipitate a hemoclastic crisis. Indeed, it is so inevitable by the very nature of the precarious equilibrium which is usually maintained in these cases that preparations should always be made to meet an emergency before it arises. One of our patients presents an excellent example of the point in question:

CASE 3 (charts 2 and 4).—H. L. S., a man, aged 50, a mail carrier, admitted to the research service of the University Hospital by ambulance from Akron, Ohio, Dec. 4, 1933, complained of epigastric pain and a deepening jaundice of six days' duration. November 29, while delivering mail, he had experienced an acute attack of severe epigastric pain with vomiting, which suddenly and completely disabled him. During the next eighteen hours a definite jaundice appeared, which grew progressively deeper. The pain was intermittent, alternating between a dull ache and sharp, lancinating exacerbations radiating to the right scapular region. He lost approximately 20 pounds (9 Kg.) in less than a week. No acholic stools were noted. The temperature was from 97.2 to 98.2 F., the pulse from 80 to 88, red cells 3,600,000 and hemoglobin 70 per cent.

Our first laboratory examinations showed: red blood cells, 3,820,000; hemoglobin, 12.4 Gm.; color index, 1.05; reticulocytes, 7.6 per cent; hematocrit, 38 per cent; mean diameter of

the red blood cells, 6.88 microns; mean cell volume, 100 cubic microns; mean corpuscular hemoglobin, 32 micromicrograms; mean corpuscular hemoglobin concentration, 32 per cent; erythrocyte fragility, 0.582 to 0.300; corrected erythrocyte sedimentation, 0.6 mm. per minute; icterus index, 882; white blood cells, 12,000, with 92 per cent neutrophilic leukocytes, 1 per cent basophils, 1 per cent small lymphocytes, 6 per cent monocytes, no immature forms; the blood was type AB. The urine was normal save for the high concentration of bile. The stools were of normal color and consistency and there was no occult blood. The direct van den Bergh test was immediately positive and the quantitative indirect test was 21 mg. The blood cholesterol was 197 mg., further confirming the relative quiescence of the hemolytic process. Wassermann and Kahn reactions were negative and remained consistently so. The electrocardiographic studies revealed no significant cardiac abnormality. On roentgen examination a small annular shadow, about 1 cm. in diameter, was discernible just to the right of the upper part of the third lumbar vertebra; the gallbladder was nonfilling.

During the next forty-eight hours the red count fell to 3,000,000, the hemoglobin to 11 Gm., the reticulocytes rose gradually to 14.2 per cent, and the icterus index decreased appreciably to 652, 555 and 428 and then started to rise again to 440.

The observations thus indicated an icterus of double origin; first an older fairly quiescent congenital hemolytic form, with splenomegaly, and, secondly, a recent, acute, obstructive form, due to common duct stone. Since some 70 per cent of patients with hemolytic icterus are known to develop pigment calculi in the gallbladder, such an incident as described is easily explained and may be anticipated in these patients. The hemolytic factor in the beginning was negligible, but, as frequently happens, the trauma incident to the obstructive symptoms began to activate the hemolytic process. Two courses of management had therefore to be considered: (1) immediate splenectomy, to stop an impending erythroclastic crisis, or (2) a prior cholecystostomy, in the attempt to relieve the acute cholemia and prepare the way for a safer hemostasis in whatever major operative procedures might be required subsequently. The relatively good level of red cells and hemoglobin, with as yet little evidence of severe hemolysis, determined our decision to follow the second course, hoping that the anticipated precipitation of an acute hemoclastic crisis might be delayed long enough to permit of a subsidence of the major part of the obstructive element in the jaundice.

On the night before, and again on the morning of operation, the patient was prepared for laparotomy by the intravenous administration of 5 Gm. of calcium chloride in 200 cc. of physiologic solution of sodium chloride and by a hypodermoclysis of 1,500 cc. of Ringer's solution containing 5 per cent dextrose.

Cholecystostomy was accomplished uneventfully under local anesthesia supplemented by nitrous oxide-oxygen between 10 a. m. and noon, December 7.

Prompt and rapid relief from the cholemia ensued. By the afternoon of the day of operation the icterus index had dropped to 250, the next morning it was 164, and forty-eight hours after the operation it was 94. However, during the first thirty-six hours the erythrocytes decreased a million cells and the hemoglobin 3.7 Gm., while the reticulocytes rose coincidently to 20 per cent. Frequently repeated observations confirmed the acuteness and the severity of the erythroclastic crisis, which had been threatened by the original spontaneous obstruction and which, by the manipulation and trauma incident to the operation, had become fully precipitated. The red cells continued to fall rapidly, to reach a low of 1,610,000 by 9 p. m., December 9; the hemoglobin fell to 3.9 Gm. and the cholesterol to 130 mg., at which time the icterus index had ceased to fall and had begun to rise again from 94 to 125 within seven hours. A sharp change in the clinical picture occurred, and it was apparent that a fatal outcome threatened, unless adequate measures were promptly instituted. Transfusion was definitely contraindicated. From the experiences already cited, it seemed evident that splenectomy was the only rational measure to employ to arrest this unusually severe, though anticipated, hemolytic complication, and it was felt that we could reasonably count on the customary postsplenectomy autotransfusion in the convalescence, if the operative procedure itself was safely accomplished.

The patient was prepared immediately, therefore, for his second major operation within sixty hours with calcium, dextrose and fluids, as before. At 10 p. m., December 9, just fifty-eight hours after the cholecystostomy, an emergency splenectomy was successfully performed under local and nitrous oxide-oxygen anesthesia. Epinephrine, 1 cc., was administered twenty minutes before the splenic pedicle was clamped to ensure maximum contraction of the organ. The spleen was removed through a left subcostal Kocher incision without undue difficulty or untoward incident. The blood pressure remained around 140 systolic, 50 diastolic, throughout the procedure and prompt postanesthetic recovery followed.

The spleen weighed 1,740 Gm. and measured 22 by 15 by 9 cm. It was firm and contracted. The white opaque capsule was in some places as thick as 4 mm. The splenic parenchyma was dark red, cellular, somewhat friable and more fibrous than normal. Microscopically the pathognomonic picture of hemolytic icterus, including infrequent atrophic follicles, erythrocytic engorgement, prominent edothelial nuclei and clasmatocytes, and empty sinuses, was confirmed.

Immediately on the removal of the spleen the unfavorable course of events of the preceding forty-eight hours was strikingly changed. The red cells immediately after operation jumped to 2,380,000 (a gain of approximately 800,000), with the hemoglobin 6.6 Gm. (a gain of 2.7 Gm.). The icterus index again showed a downward trend with a reading of 100. These results and the other clinical and laboratory data were doubly significant in that they not only reflected an actual, almost instantaneous, increased availability of important cellular elements essential to the vital functions of the body but at the same time revealed as a part of the mechanism of accomplishment of that end the abrupt termination of the fulminating hemolytic process, which had so rapidly plunged the patient into extreme danger. The steady upward trend of the red cells and hemoglobin from this point, the prompt return of the reticulocyte percentage and icterus index to normal, and the leukocytic reaction may be followed in chart 4. At no time in the subsequent stormy convalescence (cholecystoduodenostomy and lung abscess) was the hemolytopoietic equilibrium again seriously disturbed, the bone marrow meeting all demands promptly and efficiently as they arose, without any evidence of decompensation or incapacity.

THROMBOPENIC PURPURA

The similarity and dramatic suddenness with which certain types of acute, fulminant thrombopenic purpura can be arrested by emergency splenectomy have led us to incorporate one such instance, which has come under our immediate care, in this communication. Our chief interest throughout these studies of the past decade, whether they have been animal experiments or human clinical problems, has been the further understanding of the pathologic physiology of the spleen. This organ has been amply demonstrated to contain within itself the potential sources for inhibition of marrow hematopoiesis or/and the sequestration and destruction of the circulating elements of the blood emanating from the marrow. The same fundamental considerations apply, therefore, whether the chief pathologic manifestation of such activities is reflected primarily in red cells, in the platelets or in the granulocytes.

While accepted as a procedure of some promise in the more chronic thrombopenic states, the question of the safety and rationale of splenectomy under the critical circumstances attending an acute thromboclastic crisis continues to be debated, even as in hemolytic jaundice. The consensus of the best surgical opinion at the moment seems to be against operation

except in those instances in which some degree of chronicity exists, or may, by medical means, be induced.[9]

CASE 4 (charts 2 and 5).—E. M., a Negro girl, aged 17 years, was admitted to University Hospital as a transfer from another hospital, June 23, 1934, with the diagnosis of aplastic anemia with symptomatic purpura.

The laboratory studies showed an anemia of 1,770,000 red blood cells, hemoglobin 4.9 Gm. (Newcomer), color index 0.9, reticulocytes 57 per cent, erythroblasts 1,200, normoblasts 2,400 per cubic millimeter, mean erythrocyte diameter 8.6 microns with both anisocytosis and poikilocytosis extreme on direct examination but with no "sickling," immediate or delayed; erythrocyte fragility was markedly decreased, hemolysis starting at 0.319 and not complete until something less than 0.210 salt equivalent; icterus index 6; leukocytes 30,000, with 67 per cent actively motile, mature, neutrophilic granulocytes, 5 per cent myelocytes C and metamyelocytes, 1 per cent eosinophils, 18 per cent lymphocytes, 9 per cent monocytes; blood platelets 3,500; bleeding time twenty-three minutes; coagulation time (Howell) eleven minutes; calcium time twelve minutes; prothrombin time twelve minutes; no clot retraction in twenty-four hours; tourniquet test (50 mm. of mercury) showed innumerable petechiae after ten minutes. The Wassermann and Kahn tests were negative; carbon dioxide combining power 36; blood group O. Blood cultures were negative. The daily temperature fluctuation ranged from 99 F. to 104 F.

In spite of intensive medical treatment—intramuscular whole blood 50 cc. within the first twenty-four hours and 500 cc. intravenously during the second day, electrical cauterization of the cervical canal with firm packing, oral hygiene, orange juice 1 pint three times a day, viosterol 10 minims (0.6 cc.) three times a day[10] and a high fat-protein diet[11]—the total red blood cell count fell rapidly until on the morning of the fourth day it was found to be only 725,000, hemoglobin 2.4 Gm., nucleated red cells 6,000, reticulocytes 30 per cent and leukocytes 25,000, with absolutely no blood platelets to be found (chart 5). The patient was comatose and moribund. An emergency transfusion of 700 cc. of blood at 11 a. m. raised the red count to 1,230,000; another of 400 cc. was given at 7 p. m. the same day. The blood count at 7:45 the next morning, June 28, showed erythrocytes 1,660,000, hemoglobin 4.9 Gm., leukocytes 10,800, blood platelets, 0. The clinical condition of the patient was the best it had been since admission, temperature 99.6 F., pulse 88, respiration rate 24, blood pressure 100 systolic, 58 diastolic. The mentality was clear; the patient was bright and responsive. It was decided thereupon to resort to surgery without further delay, a ligation of the splenic artery[12] to be attempted if splenectomy for any reason seemed inadvisable.

Under local procaine hydrochloride and nitrous oxide-oxygen anesthesia a spleen weighing 225 Gm. was removed without difficulty and with a minimum loss of blood. At the conclusion of the operation the pulse was 96, respiration rate 24, blood pressure 140 systolic, 90 diastolic, red blood cells 1,990,000, reticulocytes 15 per cent, hemoglobin 5.9 Gm., leukocytes 14,800, blood platelets 21,900. The maximum leukocyte count of 52,000 with 85 per cent active mature neutrophils was reached twenty-four hours after operation, the red cells at that time being 2,230,000, hemoglobin 6.2 Gm. and blood platelets 89,000, with all bleeding stopped.

The blood platelets, showing a marked variation qualitatively in individual size, increased steadily in number on every count after operation until a total of 395,000 was reached on the fourth postoperative day, following which there was a gradual fall during the next eight days without symptoms or signs. A spontaneous recovery carried the total to 748,000 by the twenty-second postoperative day. The condition of the mouth cleared promptly with the cessation of the hemorrhages; the offending molar was extracted on the fifteenth postoperative day, and the teeth and gingivae were given much needed attention. The red cells never again fell below 2,000,000; the reticulocytes promptly decreased, and both hemoglobin and cell count rose gradually until on the twentieth day 3,400,000 erythrocytes were recorded. The bleeding time became normal, clot retraction occurred promptly and the tourniquet test was negative for petechiae after ten minutes at 50 mm. pressure of mercury. The temperature and pulse returned to within normal limits by the ninth day and the patient was discharged from the hospital on the twenty-second postoperative day.

The patient has maintained an entirely normal existence for the past year, with the platelet count maintained at or above a million units per cubic millimeter consistently (chart 5).

CONTROL OBSERVATIONS

The influence of any major surgical procedure and of anesthesia on the cellular equilibrium of the blood and on the blood producing and blood regulating mechanisms of the body must be known before any specificity may be attributed to the changes noted following splenectomy. In chart 1 it will be noted that in two of the patients with hemolytic jaundice other major operative procedures were carried out.

In chart 4 the influence of cholecystostomy before and of cholecystoduodenostomy after splenectomy may be compared in the same individual. Only following splenectomy were the spectacular recovery changes in the hemolytopoietic equilibrium apparent, a precipitous hemoclastic crisis being stopped instantly with removal of the spleen, just fifty-eight hours after a major operative procedure in the opposite abdominal quadrant.

Chart 6 carries the cytologic changes in fourteen cases in which operation was done for a variety of conditions, and illustrates the lack of uniformity in the degree and the direction of the reactions.

It would seem fair to conclude that the removal of the spleen removes certain inhibitory and destructive influences which ordinarily affect all the circulating units, including the lymphocytes, which, after a latent period of some two weeks, definitely seek a new and higher level in the circulation. The surgical removal of other body structures does not seem to influence the cellular equilibriums of the blood to the same extent.

A million gain the first twenty-four hours, with the consolidation of the gain during the first week; the second million gain by the end of the first month, and, following that, a more or less rapid ascent to an absolutely normal erythrocyte level is the story depicted in chart 2 for the six individuals who have undergone emergency splenectomy as described.

ETIOLOGIC CONSIDERATIONS

Our studies of the past five years have led us to incriminate the spleen as the major pathologic agent in hemolytic jaundice for the following reasons: 1. Qualitative changes in the erythrocytes—microcytosis, increased reticulocytosis and increased fragility—are not necessarily present in every clinical case, even with acute symptoms. 2. Anemia, when present, is always accompanied by acholuric jaundice or other evidence of excessive hemolysis. 3. The more severe the anemia the greater the bone marrow activity, as measured either by reticulocytosis (usually the higher the reticulocytes the more severe the hemolysis) or by direct observations of erythroblastic hyperplasia of the bone marrow. 4. Splenomegaly, and the number and activity of the splenic phagocytes, fluctuates directly with the severity of the anemia and the icterus. 5. The splenic artery, in several instances of sampling just prior to

9. Whipple.[5] Spence.[5]
10. Phillips, R. A.; Robertson, D. F.; Corson, W. C., and Irwin, G. F.: Effect of Irradiated Ergosterol on Thrombocytes and Coagulation of Blood, Ann. Int. Med. **4**: 1134 (March) 1931.
11. Kugelmass, I. N.: Clinical Control of Chronic Hemorrhagic States in Childhood, J. A. M. A. **102**: 204 (Jan. 20), 287 (Jan. 27) 1934.
12. von Stubenrauch, L.: Die Ligatur der Arteria lienalis, Deutsche Ztschr. f. Chir. **172**: 374, 1922. Rossi, C.: Effetti della legatura dei vasi splenice sulla structure e funzione della milza, Ann. ital. di chir. **6**: 127 (Feb. 28) 1927. Payr, E.: Ueber die Drosselung der Milzarterie mit Fascie, Arch. f. klin. Chir. **167**: 512, 1931.

ligation, contained more cellular elements than the splenic vein. 6. The epinephrine test reveals an excessive cellular sequestration capacity of the spleen in congenital jaundice. The data accumulated following splenectomy further support this thesis in that: 7. Hemoclastic crises, spontaneous or precipitated, may be terminated instantly by successful removal of the spleen and do not recur. 8. The total volume of circulating red blood cells becomes immediately increased, as much as 77 per cent of the original volume. 9. A normal erythrocyte equilibrium is reestablished and indefinitely maintained, with 10. Restitution of a relatively normal bone marrow—functionally and topographically—as reflected by the reduction to normal of the erythroblastic hyperplasia, the disappearance of the high peripheral reticulocytosis, the recovery from the myeloid hypoplasia with correction of the peripheral neutropenia, the elimination of the megacaryocytic hypoplasia or hypofunction with reversal of the peripheral thrombopenia and the maintenance of an elevated thrombocytosis, the return of the erythrocyte diameters (Price-Jones curves) more nearly to the established limits for normal, a decrease in the erythrocyte volume-thickness index (Haden), and the increase in erythrocyte resistance sometimes to an entirely normal range, and finally, 11. The clinical recovery is complete and permanent so far as the hemolytic tendency is concerned.

The facts that relate to the pathologic physiology of the spleen as inferred from this study may be applied in other instances to appraise the significance of the spleen in less clearly defined syndromes. The objective in all analyses of biologic problems should be an understanding of the underlying mechanisms involved, and all therapy should be directed toward a correction of, or, as in this instance, to the elimination of the dysfunctioning unit. Once the physiologic mechanism is understood and the technical facilities for testing its efficiency and adequacy are available, the physician may hope to place his therapy on a rational basis.

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CONCLUSIONS

1. The pathologic physiology of the spleen may be manifest through either or both of two mechanisms (*a*) inhibitory, (*b*) destructive—and may affect any or all of the circulating blood elements.

2. The spleen is the major pathologic agent in congenital hemolytic jaundice.

3. Splenectomy is indicated as a prophylactic measure against clinical exacerbations of excessive hemolytic activity in the chronic and subacute manifestations of the disease.

4. Splenectomy is also the therapeutic procedure of choice in acute hemoclastic crises, whether the crisis is of spontaneous or of precipitated origin, and regardless of the severity of the anemia.

5. The immediacy of the erythrocyte response following splenectomy in hemolytic jaundice is dramatic, occurring on the operating table. It is usually a million or more cells per cubic millimeter in quantity and represents a true increase in total available circulating units. This autotransfusion removes the necessity for preoperative and/or postoperative transfusions.

6. Splenectomy is not contraindicated in properly selected cases of thrombopenic purpura in acute crisis, provided adequate preoperative blood transfusions are given. The immediacy of the beginning recovery and reappearance of blood platelets in the circulation following splenectomy in thrombopenic purpura may be quite as dramatic as the changes noted in hemolytic jaundice.

7. The responses recorded following splenectomy in this series are not the result of the operative or anesthetic influences per se, since the same studies in a series of miscellaneous operations performed under identical conditions did not yield similar results. More impressive still, three major operative procedures other than splenectomy were performed either before or after splenectomy in two patients with hemolytic jaundice, and the cellular responses were quite unlike.

We are indebted to Drs. Verne Dodd and Luke Zartman for the splenectomies in cases 1 and 2 and to Dr. Carl Moore, National Research Council Fellow in this department, for the blood volume studies; also to Drs. Lowell Erf and M. M. Hargraves, medical residents, and to Dr. Louis Barron, surgical resident in the Research Service, University Hospital, for assistance and cooperation in the care of certain of the patients in this series.

ABSTRACT OF DISCUSSION

DR. IRVIN ABELL, Louisville, Ky.: I was particularly impressed by the advocacy by the authors of immediate splenectomy in hemolytic and purpuric crises, a course diametrically opposite to that which heretofore has been thought the wisest to follow. In the light of their results the proposal merits one's earnest consideration. Advantage has been taken of the reservoir function of the spleen and the fact that it can be made to empty itself by the injection of epinephrine, to prevent the loss of its stored blood during splenectomy. After the incision has been made and the spleen exposed, an injection of epinephrine is given causing the organ to contract, forcing its contained blood into the general circulation and at the same time effecting a decrease in size and an increase in consistency that may facilitate its removal. Complete and repeated blood studies constitute the essential factor in deciding for or against operation and, in the event of the former, in determining the time of its performance.

DR. G. M. CURTIS, Columbus, Ohio: During the last thirty-two months I have performed twenty-seven splenectomies for various blood diseases. The blood picture has been followed thoroughly previous to, immediately after and subsequent to removal of the spleen. The outstanding success has been in congenital hemolytic icterus. These patients have all survived. My outstanding failure has been in attempting splenectomy for late Banti's disease. Owing to extensive adhesions and unusual vascularity, this is a technically difficult and hazardous procedure. Occasionally in hemolytic icterus the enlarged spleen is adherent to the diaphragm. However, a useful cleavage plane may be found between the thickened capsule and the pulp. This is not possible in Banti's disease, since the sclerosis involves the connecting capsular trabeculae. It is the usual teaching that the acute hemoclastic crisis of congenital hemolytic icterus and the acute thromboclastic crisis of thrombocytopenic purpura contraindicate splenectomy. This is not my experience. I have made three splenectomies for the acute crisis occurring in congenital hemolytic icterus. My colleagues have made two more. I have made one splenectomy for the acute crisis of thrombocytopenic purpura. These six patients recovered, are all living and are well. The rationale of this departure from the common teaching followed a cooperative study with my colleagues Doan and Wiseman. Following our first splenectomies there ensued a definite and immediate postoperative rise of the red cells and of the hemoglobin. Dr. Doan has presented those data. This amounted essentially to an autotransfusion. The evidence became convincing that the spleen is primarily responsible for the increased blood destruction. Therefore when an acute crisis came it seemed logical to remove the spleen. From our previous studies we depended on a postoperative autotransfusion. In certain cases of failure after splenectomy for congenital hemolytic icterus or for thrombocytopenic purpura, we would advise searching for an accessory spleen. We find them in making these splenectomies. Therefore it is reasonable to assume that

when the symptoms recur they may be due to an accessory spleen. These results consider a further indication for splenectomy. They afford added hope in the control of severe hemoclastic crises and throw more light on the pathologic physiology of the spleen. This newer information should prove of value in evaluating the fundamental rule of the spleen in blood dyscrasias.

DR. B. K. WISEMAN, Columbus, Ohio: My feeling with regard to hemolytic icterus is that all these patients should be operated on as soon as the diagnosis is made. Many, probably most, of these patients show little of the external manifestations and not very much of the hematologic characteristics of their disease. Under such circumstances it is often the practice to defer splenectomy with the hope that possibly the operation will not be necessary. Because of the tendency of this disease to change from one of perhaps extreme chronicity to the acute phase with alarming and dangerous features on the advent of a primary infection, it often follows that operation must be then performed under most unfavorable conditions. In some circumstances this occurs in a remote region in which the underlying condition will not be recognized readily. Dr. Doan has shown that there is no doubt that emergency splenectomy can be done and is a life-saving measure (contrary to common belief) during an acute hemolytic crisis. Nevertheless the added factor of extensive hemolysis, together with in some cases the presence of the affliction that precipitated the crisis, adds a definite hazard to the chances of survival. Early operation in Banti's disease is also, I feel, very important. Of all the blood dyscrasias, Banti's disease is perhaps the most difficult to diagnose, especially in the early phases. It therefore seems advisable at times to operate before a positive diagnosis can be made. Operated early, before cirrhosis of the liver is advanced, portal obstruction is evident or dense perisplenic adhesions are formed, it is attended by the usual low surgical mortality, and the maximal benefit accrues to the patient. Therefore it will often be necessary to operate on a well founded suspicion and not a clear cut diagnosis. With the possible exception of myeloid leukemia, there is no blood dyscrasia that we have found to be unfavorably affected by splenectomy.

DR. WILLIAM DAMESHEK, Boston: I was particularly interested in the marked almost immediate increase in red cell count following splenectomy, mentioned by the authors. I wonder whether this might not be due to unavoidable handling of the spleen which takes place at time of operation. The normal spleen contains about 250 cc. of blood. In congenital hemolytic jaundice the spleen becomes very much enlarged and the splenic sinusoids are dilated; therefore it must contain a much larger quantity of blood. The sudden increase in red cell count might conceivably be due to squeezing out into the general circulation of a fairly large volume of blood from the spleen. The list of reasons given in the article for implicating the spleen as the fundamental cause for congenital hemolytic jaundice is an imposing one, but several of them may be secondary to the fundamental bone marrow dysfunction stressed by several authors, particularly Naegeli and Haden. These investigators have shown that the bone marrow in this disease produces abnormally small, thick (and thus more fragile) red cells susceptible of ready disruption and fragmentation. The spleen, together with the remainder of the reticulo-endothelial system, becomes hyperplastic, probably as the result of the increased amount of activity demanded of that organ in breaking down an increased number of red cells. Some of the phenomena listed by the authors may thus be secondary to this hyperplasia of the reticulo-endothelial system (and spleen) rather than primary manifestations. In purpura one should be very conservative regarding splenectomy, even though it cannot be denied that this procedure will result in great improvement. A number of our patients with splenectomy are beginning to bleed years later. Before finally deciding on this major operative procedure, one should always attempt to do everything possible in the way of conservative medical treatment, such as high vitamin, high protein diet, and roentgen therapy over the spleen.

DR. E. B. KRUMBHAAR, Philadelphia: The spleen is undoubtedly the major offender in hemolytic jaundice, and this constitutes an excellent reason for taking it out. On the other hand, I think perhaps Drs. Doan, Curtis and Wiseman would agree that the primary defect is in the red cells for the reasons that Dr. Dameshek gave. It may be that there is also a primary defect in the spleen, or it may be that the spleen acquires the rôle of chief offender from long practice in destroying these futile, congenitally poor red cells of hemolytic jaundice. Undoubtedly, when the spleen of hemolytic jaundice is taken out there is a substantial rise, often very quick, in the erythrocyte level; but I would call attention to the possibility at least (I think it is more than a possibility) that the spleen normally aids in red blood cell formation. Because a diseased spleen has been taken out, it must not be inferred that the rôle of the normal spleen is one of inhibition of red cell formation. I have been studying this for several years and still stand by the conclusion that the normal human spleen has a stimulating effect on the bone marrow in ways that are not yet apparent, perhaps associated with the metabolism of broken-down red cells and some of their products. At any rate, if a normal spleen is taken out, there will be a period of temporary depression of bone marrow activity with temporary anemia, which eventually will be compensated for just as most of the functions of the absent spleen will be compensated for by other parts of the reticulo-endothelial system.

DR. C. A. DOAN, Columbus, Ohio: I realize the departure from accepted facts that my observations imply, and the rightful skepticism aroused by certain of my conclusions; and were it not that I have observed multiple repetitions of the same phenomena over a period of five years, I should not feel justified in reopening some of the questions that have been raised. Banti's disease is admittedly difficult to influence favorably in its later stages, and in three instances in this series splenectomy was unsuccessful. In two early cases, however, the immediate and remote results have more than justified the operative intervention. I may not have made it sufficiently clear that in the patients with acute hemoclastic crises splenectomy was advised, at the beginning of this study, only in the face of failure of other less radical measures. Intensive liver therapy, adequate iron and repeated blood transfusions preceded operation in practically every instance without beneficial effect. More recently I have not risked delay in the face of a crisis. The idea is prevalent that removal of the spleen is incompatible with longevity. I well remember seeing the first patient ever operated on in this country for hemolytic jaundice, for twenty-five years shown annually by Dr. Thayer before the senior clinics at the Johns Hopkins Hospital. The patient, an invalid during the first twenty-five years of his life, was completely rehabilitated after splenectomy and remained in excellent health for the succeeding quarter of a century. Four years ago Lord Dawson reported that a number of patients with congenital hemolytic jaundice, splenectomized prior to 1914, went through the war without physical limitations or handicap. The spleen is not essential to life; conversely, it may at times be exceedingly dangerous to existence. The mechanism of the prompt increase in the cellular level following splenectomy has been demonstrated adequately in the blood volume studies. Both an absolute increase in circulating units and some decrease in plasma volume contribute to the immediate phenomenon. An unusually active bone marrow thereafter maintains and supplements this initial gain and rapidly and effectively reestablishes the normal cellular balance in the absence of the pathogenic spleen. This interpretation, of course, introduces the controversial point as to the relative rôles of bone marrow and spleen in hemolytic icterus. I have already presented my reasons for believing the spleen to be the chief offender in this disease. I would reemphasize the necessity for the closest possible cooperation between the hematologist and the surgeon in the diagnosis and therapeutic management of these cases. Only by the intelligent analysis of each patient as an individual and a full understanding of the mechanism of the disease process, as it is reflected in certain constantly changing signs and symptoms, may optimal clinical results be expected.

Blood Pressure.—If a patient has diseased arteries, a small rise of blood pressure may be very important from the point of view of possible cerebral hemorrhage.—Dr. Maurice Campbell, F.R.C.P., quoted by Fisher, Alexander. Aphorisms in Clinical Medicine, *Canad. J. Med. & Surg.* **77**:166 (June) 1935.

THE CHOICE AND INTERPRETATION OF TESTS OF RENAL EFFICIENCY

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The importance of measuring the functional ability of the kidneys in renal disease need not be emphasized. The value of a knowledge of renal efficiency as an aid in the diagnosis, prognosis and treatment of Bright's disease has been pointed out by Christian,[1] Van Slyke [2] and others. The existence of renal disease, which may be suggested by proteinuria or other changes, may often be proved only by demonstrating impairment of kidney function. Van Slyke and his collaborators [2] call attention to the fact that the degree of proteinuria, hematuria and hypertension is no indication of the severity of the renal lesion and is of little or no prognostic importance, but that the functional capacity of the kidneys is an accurate index of the gravity, course and prognosis of Bright's disease. Lashmet and Newburgh [3] have pointed out that the degree of functional impairment governs the fluid needs of the nephritic patient, one of the most important therapeutic considerations.

It becomes of great concern, therefore, to know how best to measure renal efficiency. All the numerous methods proposed are based on one of three principles: (1) the ability of the kidneys to concentrate and dilute urine, (2) the effectiveness of the kidneys in eliminating introduced substances, such as phenolsulphonphthalein, and (3) the success of the kidneys in excreting normal metabolic waste products, which can be studied by comparison of the urinary and blood values of the various waste products (so-called clearance tests) or by determining the concentration of these wastes in the blood.

During the past few years I have been occupied in determining the relative worth of various kidney function tests, based on these different principles.

METHODS

Whenever it was desired to determine renal efficiency, three procedures were employed, each based on a different one of the three principles. The concentrating ability of the kidneys was measured by the method described by Lashmet and Newburgh.[4] The urea excreting ability was measured by the urea clearance test of Van Slyke because of the widespread usage of this test and its already demonstrated worth. The fifteen-minute phenolsulphonphthalein excretion test was used to measure the efficiency of dye elimination for the following reasons: It has been shown by Van Slyke [5] and others that the total two-hour phenolsulphonphthalein excretion test measures impairment of kidney function only when extensive renal damage exists. Recently, Chapman and Halstead [6] have pointed out that the excretion of this dye during the first fifteen minutes after its injection is a much more sensitive test and, in their experience, comparable to the urea clearance as a measure of renal efficiency.

Because it has been clearly shown by a number of investigators that retention of catabolic waste products does not occur as a result of kidney damage, except when the renal injury is severe, blood nonprotein nitrogen and blood urea determinations were not made as a routine.

With these three procedures in each case, then, the Lashmet-Newburgh concentration test, the Van Slyke urea clearance, and the fifteen-minute phenolsulphonphthalein excretion, renal efficiency was measured 412 times in 254 different patients whose clinical diagnoses included hemorrhagic nephritis (with and without the "nephrotic syndrome"), arteriosclerotic Bright's disease, pyelitis, pyelonephritis, tuberculous kidney disease, polycystic kidney disease, renal amyloidosis, pregnancy, and other clinical conditions in which impairment of kidney function was suspected.

Technical Considerations.—Specific gravity of the urine was determined by a carefully calibrated urinometer during the early part of this study and later by a special Westphal balance. Since only the nonprotein specific gravity indicates the concentrating power of the kidneys, proteinuria was quantitatively determined and the nonprotein specific gravity obtained from the observed specific gravity according to the method described by Lashmet and Newburgh.[7] Whenever concentrating ability of the kidneys is referred to hereafter, nonprotein specific gravity of the urine is implied.

The urea clearance was determined by the simplified technic described by Van Slyke and Cope.[8]

To test dye excretion, 6 mg. of the sodium salt of phenolsulphonphthalein was injected intravenously and the amount in the urine determined by color comparison (in a colorimeter) with a standard freshly prepared from the same lot of dye injected into the patient.

All technical procedures were performed by only two individuals, so that personal variations might be lessened.

TABLE 1.—*Kidney Function During the Initial Stage of and Recovery from Hemorrhagic Nephritis*

Patient	Date	Urine: Protein	Urine: Blood	Concentrating Ability, Specific Gravity	Urea Clearance, per Cent	15-Minute Phenolsulphonphthalein, per Cent	Comment
B. B.	2/15/34	+	Gross	1.027	77	28	Initial stage
B. L.	8/20/34	Trace	0	1.026	109	31	Initial stage
	1/24/35	0	0	1.035	130	35	Well
D. S.	3/22/34	++++	Gross	1.012	13	3	Initial stage
	6/22/34	+	Microscopic	1.023	51	26	Recovering
	8/ 1/34	0	Microscopic	1.024	61	27	Recovering
	11/13/34	0	Microscopic	1.026	98	31	Recovering
L. S.	2/20/35	+	Gross	.....	83	29	Initial stage
	3/ 7/35	+	Microscopic	1.025	93	30	Recovering
E. M.	6/20/34	Trace	Microscopic	1.028	98	18	Latent stage
	8/10/34	0	Microscopic	.....	90	22	Recovering
	11/23/34	0	0	1.029	81	18	Well
J. J.	3/ 4/33	+++	0	1.028	88	..	Recovering
G. H.	7/20/34	..	.....	.....	50	31	Initial stage
	8/ 4/34	+	Microscopic	1.025	71	30	Recovering
	11/16/34	0	Microscopic	1.028	79	24	Recovering
	4/14/35	0	Microscopic	1.031	94	..	Recovering

From the Department of Internal Medicine, University of Michigan Medical School.

Read before the Section on Pathology and Physiology at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 14, 1935.

1. Christian, H. A.: The Use of Tests of Renal Function in Cases of Nephritis, J. Urol. **1**: 319-349 (June) 1917.
2. Van Slyke, D. D., and others: Observations on the Courses of Different Types of Bright's Disease, and on the Resultant Changes in Renal Anatomy, Medicine **9**: 257-386 (Sept.) 1930.
3. Newburgh, L. H., and MacKinnon, Francis: The Practice of Dietetics, New York, Macmillan Company, 1934, p. 233.
4. Lashmet, F. H., and Newburgh, L. H.: An Improved Concentration Test of Renal Function, J. A. M. A. **99**: 1396-1398 (Oct. 22) 1932.
5. Van Slyke, D. D.; McIntosh, J. F.; Möller, Eggert; Hannon, R.R., and Johnston, Christopher: Studies of Urea Excretion: VI. Comparison of the Blood Urea Clearance with Certain Other Measures of Renal Function, J. Clin. Investigation **8**: 357-374 (April) 1930.
6. Chapman, E. M., and Halstead, J. A.: The Fractional Phenolsulphonphthalein Test in Bright's Disease, Am. J. M. Sc. **186**: 223-232 (Aug.) 1933.
7. Lashmet, F. H., and Newburgh, L. H.: An Improved Concentration Test of Renal Function: II. Simple Method for Measuring Proteinuria, J. A. M. A. **100**: 1328 (April 29) 1933.
8. Van Slyke, D. D., and Cope, C. L.: Simplified Colorimetric Determination of Blood Urea Clearance, Proc. Soc. Exper. Biol. & Med. **29**: 1169-1174 (June) 1932.

Normal Values.—Under the conditions of the concentration test, the specific gravity of the urine should reach 1.029, or higher. When the maximum specific gravity is less than 1.029, impairment of function is indicated. Blood urea clearance is reported in per cent of mean normal. The interpretations of the originators of this test have been adopted to consider values between 75 and 125 per cent as normal, values greater than 125 per cent as indicating hyperfunction, and values below 75 per cent as indicating a renal deficit. Chapman and Halstead found the lowest fifteen-minute dye excretion by normal individuals to be 28 per cent, and I found it to be 29 per cent. The excretion of less than 28 per cent of the injected dye during the first fifteen minutes is therefore considered to indicate impairment of this function of the kidneys.

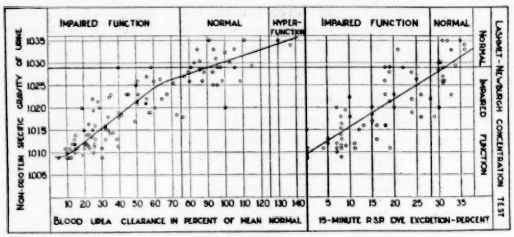

Chart 1.—A comparison of the urea clearance (left) and the fifteen-minute dye excretion (right) with the concentrating ability of the kidneys in cases of hemorrhagic nephritis. Circles indicate results in cases without edema and the dots show results in patients with the "nephrotic syndrome." The line in each graph represents the average urea clearance and the fifteen-minute dye excretion, respectively, in terms of the maximum nonprotein specific gravities obtained in concentration tests.

RESULTS

In chart 1, the blood urea clearance and fifteen-minute dye excretion are compared to the concentrating ability of the kidneys in cases of hemorrhagic nephritis. There is seen to be quite close parallelism between these different functions of the kidneys. In general, as the kidneys lose their ability to excrete concentrated urine, their urea excreting and dye eliminating function also becomes impaired. The line drawn in each graph shows the average urea clearance and dye excretion at different levels of concentrating ability. When the kidneys are able to concentrate urine to a specific gravity of only 1.025, the average urea clearance is 62 per cent, although the range is seen to be from 50 to 96 per cent. When the concentrating ability has fallen to 1.015 the average urea clearance is 28 per cent, and the range from 20 to 33 per cent. When the specific gravity is fixed at 1.010, the average urea clearance is 12 per cent, although it may range between 10 and 25 per cent. Although it may appear that there is quite a wide variation between the results of the tests studied, when one realizes that these tests are based on entirely different principles and measure totally different functions of the kidneys, it seems quite remarkable that there is the degree of parallelism that has been found.

When the relationship between the concentrating ability of the kidneys and the urea clearance in hemorrhagic nephritis (left-hand graph, chart 1) is carefully studied, several noteworthy facts become evident. In the first place, it is seen that whereas there are only two individuals able to concentrate the urine normally who failed to excrete urea normally, there are twelve individuals with normal urea clearance who were unable to concentrate normally. Is this the result of technical errors in performing the concentration test, or is this an indication that the ability of the kidneys to excrete a concentrated urine is impaired before the urea excreting power is recognizably diminished? The answer to this is quite evident after studying the data presented in table 1. During the initial stage of hemorrhagic nephritis it has been repeatedly observed that the concentrating ability is impaired before the urea clearance is measured below normal (cases B. B. and B. L.) and likewise, during recovery from hemorrhagic nephritis, the urea clearance becomes normal while the concentrating ability is still impaired (cases D. S., L. S., E. M., J. J. and G. H.). I have observed, as have Alving and Van Slyke,[9] that the maximal specific gravity of the urine may remain below normal for years after recovery of normal urea clearance. That the urine contains abnormalities (protein, casts and erythrocytes) in cases showing impaired concentrating ability and normal urea clearance, both in initial stages and recovery periods, indicates that these kidneys are not normal. There can be no doubt, therefore, that the concentration test is a more sensitive measure of functional ability in these cases than is the urea clearance.

As more and more renal damage occurs, it is seen that the concentrating ability and the urea clearance decrease quite in parallel until extreme renal damage exists. Then the specific gravtiy of the urine tends to become fixed at about 1.010 and further damage is not reflected by a decrease in concentrating ability but is indicated by a continual decrease in urea clearance. In one case it was observed that the specific gravity of the urine remained fixed while the urea clearance progressively fell from 15 to 3 per cent of normal, at which level death occurred.

When the fifteen-minute dye excretion is compared with the concentration test (right-hand graph, chart 1),

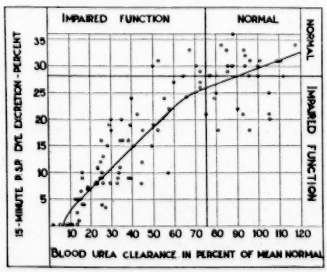

Chart 2.—Urea clearance plotted against fifteen-minute dye excretion in cases of hemorrhagic nephritis. The line represents the average urea clearance in terms of different percentage dye excretion.

it is seen that, although in general they give comparable results, the deviation from the average is wider (greater scatter in the graph). Reasons for this will be discussed in full.

In chart 2, the results of urea clearance are compared to those of the fifteen-minute dye test, in cases

9. Alving, A., and Van Slyke, D. D.: The Significance of Concentration and Dilution Tests in Bright's Disease, J. Clin. Investigation **13**: 969-998 (Nov.) 1934.

of hemorrhagic nephritis. Here again there is a wide variation of results, especially when only mild or moderate renal damage exists.

The results in patients with arteriosclerotic Bright's disease are shown in chart 3. The urea clearance and concentrating ability are seen to differ more in these patients than in cases of hemorrhagic nephritis. The most important observation is that, whereas only four cases show impaired urea excreting ability (and three

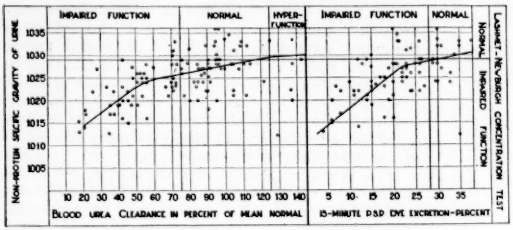

Chart 3.—A comparison of the urea clearance (left) and the fifteen-minute dye excretion (right) with the concentrating ability of the kidneys in cases of arteriosclerotic Bright's disease. The line in each graph represents the average urea clearance and fifteen-minute dye excretion, respectively, in terms of maximum nonprotein specific gravities obtained in concentration tests.

very slightly) together with normal concentrating ability, thirty-eight cases are seen to present impaired concentrating ability together with normal urea clearance, and four cases show hyperfunction by urea clearance at the time when the concentrating ability is impaired. Abnormal urine (proteinuria, cylindruria and occasionally hematuria) was found in all but a few of this group. So, even more frequently in arteriosclerotic Bright's disease than in hemorrhagic nephritis is the concentration test a more sensitive indication of functional impairment. It should be noted that the majority of these cases show less severe renal damage than do patients with hemorrhagic nephritis. When more extensive renal damage exists, the two tests parallel each other more closely.

When the fifteen-minute dye excretion is compared with the concentrating ability (right-hand graph, chart 3), it is seen that there are twelve cases in which a low dye excretion was found together with normal concentrating ability. Most of these patients had normal urea clearance and normal urine. When the dye test was repeated, in many cases normal values were obtained. These facts show that most of these low dye excretions are erroneous indications of renal function. Eight cases showed normal fifteen-minute dye excretion, together with lowered concentrating ability, but (except for one case) the specific gravity was only slightly below normal. All of the latter cases presented normal clearance. Thus it may be concluded that when fifteen-minute dye excretion is normal the kidney function is normal (or the concentrating ability only slightly impaired) but that when low values are obtained for fifteen minute dye excretion they may not be true indications of renal function.

In chart 4 are shown the results of kidney function studies that were performed on patients who were suffering from different illnesses in whom impairment of kidney function was suspected. The applicability of these tests in this miscellaneous group of clinical entities is demonstrated by the general parallelism of the results.

THE UREA RATIO

Within the past year, Mosenthal and Bruger[10] have reported that the urea ratio (the percentage of the nonprotein nitrogen which is urea nitrogen, i. e., $\frac{100 \times \text{urea nitrogen}}{\text{nonprotein nitrogen}}$) is a satisfactory index of renal efficiency. These investigators point out that the urea ratio is a correct indication of kidney function even though the concentrations of both urea and nonprotein nitrogen in the blood are within normal limits. Their report shows excellent agreement between the urea ratio and the urea clearance. This method is most attractive, since it requires only one sample of blood in order to obtain the result.

During the past few months the urea ratio has been employed along with the other procedures mentioned. The results are shown in table 2. The general parallelism of results is evident. Patients J. R., C. D., and S. L. show normal urea ratios, when other tests show impairment of renal function. This lack of agreement may be due to differences in technic.[11] This brief experience with the urea ratio has encouraged me to plan a careful comparative study of this test, using the chemical procedures employed by Mosenthal.

CONDITIONS INVALIDATING THE VARIOUS TESTS

Even when the technical manipulations are satisfactorily executed, tests of renal function may fail to measure truly the renal efficiency. The most important conditions that tend to falsify results are noted farther on.

Concentration Test.—When the concentration test is employed as described by Lashmet and Newburgh, the only clinical condition found to invalidate the results is the presence of edema held loosely in the body tissues. Even though fluid is withheld from the patient, the urine may be diluted by the excretion of edema and

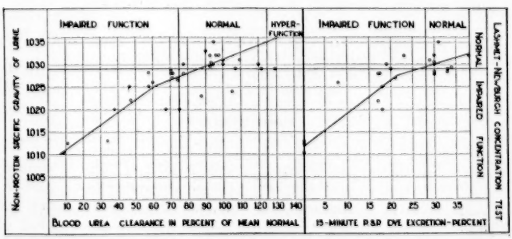

Chart 4.—Results of renal function studies in patients with various illnesses other than hemorrhagic or arteriosclerotic Bright's disease, in whom tests were performed because of suspected impairment of renal function.

have a specific gravity lower than the maximum that could be produced by the kidneys. This is especially true in cases of congestive heart failure. In patients with the "nephrotic syndrome" this error is less apt

10. Mosenthal, H. O., and Bruger, Maurice: The Urea Ratio (Urea Nitrogen per Cent of Total Nonprotein Nitrogen in the Blood) as a Measure of Renal Function, Tr. A. Am. Physicians **49**: 82-92, 1934.

11. The blood urea was determined in our laboratory by the method described by Van Slyke and Plazin (Peters, J. P., and Van Slyke, D. D.: Quantitative Clinical Chemistry: Methods, Baltimore, Williams & Wilkins Company **2**: 558, 1932), whereas the gasometric urease method of Van Slyke was used by Mosenthal.

to occur because the edema is in most cases firmly held by the tissues. Of six patients with the "nephrotic syndrome" who were studied, in two the maximal concentrating ability of the kidneys was apparently not obtained during the concentration test (table 3).

TABLE 2.—*A Comparison of the Urea Ratio with Other Methods of Measuring Renal Efficiency in a Short Series of Cases*

Patient	Diagnosis	Blood: Nonprotein Nitrogen, Mg., per Cent	Blood: Urea Nitrogen, Mg., per Cent	Urea Ratio	Urea Clearance, per Cent	Concentrating Ability, Specific Gravity	15-Minute Phenolsulphonphthalein, per Cent
F. V.	H.N.	29.2	7.9	27.0	104	.....	..
J. H.	Art.	32.9	11.4	34.6	126	1.033	34
B. S.	N.A.	35.2	12.5	35.5	91	1.030	29
J. R.	H.N.	35.7	13.5	37.8	64	1.022	28
C. D.	Art.	39.5	15.0	38.0	75	1.027	22
S. L.	H.N.	27.0	10.7	39.6	93	1.025	29
S. B.	Art.	42.6	18.7	44.0	77	1.027	20
B. R.	Art.	30.9	13.6	44.0	94	1.032	31
L. M.	Art.	41.1	18.3	44.5	74	1.026	22
F. M.	Art.	41.9	17.6	46.6	71	1.027	24
W. W.	H.N.	46.5	21.5	46.9	17	.....	..
W. S.	Art.	29.7	14.3	48.1	97	1.028	25
C. V.	Art.	40.6	21.0	51.7	47	1.019	15
J. M.	Art.	54.8	30.0	54.9	37	1.017	..
K.	Art.	63.2	37.5	59.6	45	.....	..
R. B.	H.N.	96.7	64.3	66.5	10	1.011	..
C. A.	Art.	61.9	43.0	69.4	45	1.015	6
S. M.	H.N.	178.0	144.0	81.0	5	.....	..
S. J.	H.N.	152.0	125.0	82.2	7	.....	1
B. B.	H.N.	60.2	50.0	83.0	16	.....	..
N. H.	H.N.	70.5	61.0	87.0	6	.....	0
C. G.	H.N.	146.3	130.0	88.8	4	.....	..

H.N. = Hemorrhagic nephritis.
Art. = Arteriosclerotic Bright's disease.
N.A. = Nutritional anemia.

Blood Urea Clearance Test.—The accuracy of this test depends in part on measuring the urea excreted in the urine during an exact interval of time. The most important single factor tending to falsify results is the failure to obtain all the urine formed by the kidneys during the test. Prostatic obstruction, bladder diverticula, cystocele and incontinence usually account for these failures. They can often be prevented if the urine is obtained by catheter. When there is a constant amount of residual bladder urine, the urea clearance is only slightly falsified because the urea excretion is compared with the concentration of urea in the blood, which varies but little during short periods of time.

The formulas used in calculating urea clearance contain a factor that corrects for variations in urea excretion at different rates of urine formation. However, when the urine flow is very small the urea clearance calculated as usual fails to indicate the renal efficiency correctly. This is well demonstrated by the data in table 4, which shows urea clearance determined in the same subjects when the urine flow was small (during a concentration test) and within twenty-four hours later, when the urine volume was greater. It is seen that in most cases when the volume of urine is 20 cc. per hour or less the urea clearance is low.

TABLE 3.—*Cases of Hemorrhagic Nephritis with "Nephrotic Syndrome" in Which Urine of Maximal Specific Gravity Was Not Excreted During a Concentration Test*

Patient	Date	Edema	Concentration Test: 24-Hour Urine Volume, Cc.	Concentration Test: "Maximal" Concentrating Ability, Specific Gravity	Urea Clearance, per Cent	15-Minute Phenolsulphonphthalein, per Cent
R. P.	1/28/34	Massive	1,910	1.015	24	0
	4/ 1/34	None	.....	.....	23	1
	6/22/34	None	944	1.022	37	3
	10/17/34	None	693	1.0225	33	10
	1/23/35	None	749	1.023	43	..
L. F.	4/18/34	Massive	1,388	1.020	100	..
	6/13/34	None	795	1.029	58	22
	10/ 9/34	None	902	1.029	96	31

Fifteen-Minute Dye Test.—Besides the numerous opportunities for error in technic (quantitative injection, timing, and the like), the most frequent cause for false results with this test is again failure to obtain all the urine formed by the kidneys during this short interval of time. The error is usually of a much greater magnitude than in the urea clearance test, because the quantitative recovery of a substance not normally present in the blood and urine is required. Obtaining the urine by catheter will eliminate some but not all of the failures from this cause.

In a series of kidney function studies performed during the course of pregnancy, good agreement existed between the concentration and urea clearance tests, but low results were the rule with the fifteen-minute dye excretion in voided urine during the latter part of pregnancy (table 5). When the urine for the dye test was obtained by catheter, the results were in most cases no better (table 6). The explanation for this low dye excretion is no doubt a combination of several factors: additional circulation (fetal), altered blood flow through the kidneys due to the tumor of pregnancy, and the hydronephrosis known to exist commonly during pregnancy.

TABLE 4.—*Urea Clearance When Urine Volume is Very Small*

Subject	During Dehydration (Concentration Test): Urine Volume per Hour, Cc.	During Dehydration (Concentration Test): Urea Clearance, per Cent	During Free Fluid Intake: Urine Volume per Hour, Cc.	During Free Fluid Intake: Urea Clearance, per Cent
H. J.	8	38	31	116
	11	41	25	102
I. F.	12	80	45	100
	12	67	36	77
	12.4	60	21	68
	13.5	53	28	86
T. B.	15.5	30	72	103
	17.5	48	..	...
P. G.	18	53	39	100
	15	44	39	110
M. P.	18	37	120	96
T.	16.5	73	32	130
	17	47	73	91
L. G.	19.5	55	67	93
	17.5	53	38.5	96
C. V.	17	31	50	42
H. J.	17	35	27	71
	18	42	707	63
Z. K.	24	88	186	75
	15	55	200	70
J. B.	19	56	37	90
	22	63	50	103
M. F.	20	58	84	108
L. B.	14	34	180	41
	23	48	..	...
O. L.	28	55	24	31
	24	42	57	40

THE INTERPRETATION OF TESTS OF RENAL EFFICIENCY

How are the results of the various tests of kidney function to be interpreted? When the procedures for performing these tests are kept in mind, it is at once evident that only during the concentration test are conditions such that the kidney function is measured

while the kidneys are under functional strain. Consequently, this is the only test that is designed to measure maximal function. The results of this test tend to answer the question "How efficiently can the kidneys perform their function?" whereas the other tests tend to answer the question "How efficiently are the kidneys performing their function?" It is not surprising, then, that the concentration test registers impairment of function when other tests do not, and that it is therefore a more sensitive measure of renal efficiency. Furthermore, unless falsified by the urinary excretion of edema, low specific gravity of the urine obtained during a concentration test always indicates abnormality of the kidneys.

The urea clearance test measures the urea excreting ability of the kidneys under no strain. It is therefore less sensitive, but when impairment of urea excretion is found, except when the rate of urine formation is very slow (less than 20 cc. per hour), it indicates renal abnormality.

Low fifteen-minute dye excretion theoretically should indicate renal abnormality, but in my experience the urine formed by the kidneys during this short period of time is so infrequently quantitatively recovered that I have come to interpret this test as follows: If the fifteen-minute dye excretion is normal, no appreciable

TABLE 5.—*Kidney Function During Pregnancy*

Patient	Month of Pregnancy	Concentrating Ability, Specific Gravity	Urea Clearance, per Cent	Phenolsulphonphthalein Excretion	
				15-Minute, per Cent	2-Hour, per Cent
M. L.	2	1.029	86	35	78
L. K.	2	1.030	86	28	72
F. W.	8	1.032	126	30	67
K.	9	1.031	77	28	78
	9	1.035	140	32	68
E. H.	7	1.029	92	17	62
T. B.	8	1.035	115	18	79
W.	8	1.035	100	13	81
V. B.	8	1.031	79	17	65
A. B.	9	1.030	112	9	85
B. M.	9	1.030	103	19	45
E. S.	9	1.029	83	6	50
B. A.	9	.....	100	25	71
L. L.	9	.....	100	8	59
H. M.	9	.....	105	15	65
	post partum			30	

renal abnormality exists; however, if the excretion is below normal, the function should be checked by another test.

It has already been pointed out that a normal concentration of catabolic wastes in the blood does not necessarily indicate normal kidneys. A number of investigators have shown that extensive renal damage may exist and the blood urea and nonprotein nitrogen may still be within normal limits. Does abnormally high blood urea, nonprotein nitrogen or urea ratio indicate abnormality of the kidneys? This question is clearly answered by results of a controlled study of dehydration performed recently in conjunction with Drs. Maddock and Coller.[12] During dehydration produced by the omission of fluids and the administration of a dry diet to a normal adult, various tests of renal function were performed. The data presented in table 7 show that during dehydration the blood urea progressively increased, thereby increasing the blood nonprotein nitrogen and the urea ratio until all three were well above normal limits, even though the kidneys were normal, as shown by the persistence of normal urea clearance and by the excretion of urine having a very high specific gravity. Inadequate renal function existed, not because of kidney disease but because of a nonrenal abnormality, in this case dehydration. Consequently, high blood urea, nonprotein nitrogen, and urea ratios do not necessarily indicate abnormality of the kidneys. Interpretation of these values requires a knowledge of the state of hydration of the body.

It has been suggested by a number of authors that various pathologic states of the kidney are indicated by

TABLE 6.—*Kidney Function During Pregnancy*

Patient	Month of Pregnancy	Urea Clearance, per Cent	Phenolsulphonphthalein Excretion		
			15-Minute Voided Urine, per Cent	15-Minute Urine by Catheter, per Cent	2-Hour Total, per Cent
C. W.	7	133	19	22	66
M. K.	8	110	16	19	67
R. S.	9	94	13	30	63
M. M.	9	108	31	24	75
J. R.	9	130	24	17	77
M. E.	9	99	23	19	92
L. M.	9	134	21	20	80
B. A.	8	100	25	23	71
I. M.	9	82	21	22	..
V. A.	9	109	8	19	93
F. P.	9	88	8	10	54
M. F.	9	79	8	4	78

impairment of different functions of the kidney. For example, it is said that impairment of concentrating ability indicates tubular abnormality, for the normal function of the tubule is to reabsorb water and so concentrate the urine. In the present state of knowledge, it is my opinion that abnormal function, as demonstrated by clinical tests, cannot be interpreted in terms of specific renal pathologic changes.

PRACTICAL CONSIDERATIONS

The training, equipment and time necessary to perform satisfactorily tests of renal efficiency involving quantitative chemical determinations practically limit the use of such tests to institutions. The independent practitioner of medicine has left only the concentration

TABLE 7.—*Kidney Function During Dehydration of a Normal Adult*

Date	Water Balance, Grams	Blood			Urine		
		Nonprotein Nitrogen, Mg., per Cent	Urea Nitrogen, Mg., per Cent	Urea Ratio	Urea Clearance, per Cent	Specific Gravity	24-Hour Urea, Grams
Preliminary period							
Feb. 24.....	+ 379	33.5	....	....	..	1.015	7.40
Feb. 25.....	+ 12	31.0	....	....	..	1.012	7.25
Dehydration							
Feb. 26.....	−1,145	32.6	13.3	40.8	80	1.031	4.83
Feb. 27.....	−1,047	34.5	15.8	45.8	80	1.028	5.40
Feb. 28	−1,156	35.4	18.7	52.9	66*	1.035	6.60
a.m...	.....	....	20.0	....	91	1.0385	....
March 1 p.m...	− 630†	42.2	26.8	63.5	70*	1.0352	8.20
a.m...	.....	....	27.3	....	91	1.041	....
Recovery							
March 2 a.m...	+4,513	45.7	25.0	55.8	..	1.026	12.00
p.m...	.....	....	16.3	....	..	.....	....
March 3 a.m....	− 709	32.3	12.3	38.1	90	1.016	7.60

* Extremely small urine volume.
† Ingested 500 cc. water during this day.

test and the dye excretion tests. For reasons already mentioned, the test of choice in these circumstances is the concentration test, which can be performed with very little equipment and in a very short time.

SUMMARY AND CONCLUSIONS

This study demonstrates that the Lashmet-Newburgh concentration test is the only test which tends to

12. Maddock, W. G., and Coller, F. P.: Unpublished data.

measure the maximal function of the kidneys, and for this reason it is the most sensitive test of renal efficiency, often demonstrating impairment of function when other tests fail to do so. This test does not require the quantitative collection of urine. Except when performed in the presence of loosely held edema, it always gives accurate results, and low specific gravities always indicate renal abnormality.

The urea excreting function of the kidneys, as measured by the urea clearance test, becomes impaired in many cases after the concentrating ability is diminished, so that the urea clearance is a less sensitive test of renal efficiency. Throughout the greatest part of the range of kidney function, the urea clearance and concentrating ability in general parallel each other. When the renal damage is severe, the specific gravity becomes fixed at a low level and the urea clearance alone indicates progression of the renal lesion. Failure to obtain quantitatively the urine formed by the kidneys during the urea clearance test will falsify the results. Low urea clearance always indicates renal abnormality, except when the urine volume is less than 20 cc. per hour.

The two-hour phenolsulphonphthalein excretion is not a sensitive test of renal efficiency. Theoretically, the fifteen-minute dye excretion is a sensitive test of kidney function, but the obstacles to satisfactory execution of this test cause it to be unreliable. When a normal amount of dye (28 per cent or more) is excreted during the fifteen minutes after injection, one is safe in assuming that no appreciable renal damage exists. When low excretion is found, interpretation is hazardous.

Normal blood urea and nonprotein nitrogen may exist even when extensive renal damage is present, so that these values are poor indications of renal functional ability. Elevated blood urea, nonprotein nitrogen and urea ratio indicates only that the renal excretion of protein wastes is inefficient and does not necessarily indicate renal abnormality. Experience with the urea ratio has been too limited to allow an expression of opinion regarding the comparative value of this test as a measure of renal efficiency.

It is my opinion that, in order to have the most accurate and complete information regarding functional ability of the kidneys, the concentrating ability and the urea clearance should be determined.

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ABSTRACT OF DISCUSSION

DR. HERMAN O. MOSENTHAL, New York: Impaired function of the kidney, as Dr. Freyberg says, is not a single process nor does it necessarily parallel the other disturbances in chronic interstitial nephritis, such as hypertension, albuminuria, edema or uremia. There are roughly four ways in which the activity of the kidney may be curtailed, and the tests for renal function, when properly interpreted, will reveal them. 1. A restriction in the urine volume, without loss of power of concentration of solids, signalized by a high specific gravity, a low percentage of phenolsulphonphthalein excretion, an elevation of the blood urea, an increase in the urea ratio and a lowering of the urea clearance; this occurs with heart failure, in acute nephritis and in chronic nephritis with edema formation. 2. A period of normal kidney function, with the exception that there is a low specific gravity indicating inability to concentrate the urine, which follows on the conditions mentioned under 1; that is, when the passive congestion, or the edema from whatever cause, diminishes and is lifted through polyuria. 3. The same is true, that is, a diminished ability to concentrate while elimination of solids is good, in the earlier stages of chronic interstitial nephritis, when there is nocturnal polyuria and the urinary specific gravity approaches 1.010 in a fixed way; still, through the elimination of large amounts of fluid, the solids are eliminated, and that is why it is spoken of as a compensatory polyuria. That is why the low fixed specific gravity precedes the other signs of impaired renal function in chronic interstitial nephritis and why the specific gravity tests reach their maximal degree of impairment long before the other tests of renal function. 4. In the advanced cases of chronic interstitial nephritis, when only 10 per cent or less of the kidney tissue is functioning, according to urea clearance determination, there is both a low fixed specific gravity and an impaired elimination of solids; that is, the blood urea and the urea ratio rise while the urea clearance and the phenolsulphonphthalein excretion diminish. The urea determinations are the best way of measuring the impairment of the kidney to eliminate solids. The ordinary blood urea test is usually perfectly satisfactory. However, as Dr. Freyberg has said, in cases in which the level of the blood urea is normal there may still be impairment of renal function. The urea clearance test eliminates that diagnostic hazard. The urea clearance test is somewhat unpractical, however, because it requires two hours to carry through. The urea ratio, the relationship between the blood urea nitrogen and the nonprotein nitrogen, requires only one specimen of blood and is reliable. I reported the first results on it twenty years ago. I have been using it ever since and have found it to yield satisfactory results.

STUDIES ON CRYSTALLINE VITAMIN B_1

EXPERIMENTAL AND CLINICAL OBSERVATIONS

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The vast amount of literature that is accumulating on this question of vitamins and their deficiency states has, unfortunately, served to confuse rather than to clarify the clinical aspects of this subject. Very few of the publications available to the profession shed a clear light on the problems involved or offer a satisfactory mode of approach to them.

One of the principal reasons for the prevalent confusion is the growing use of pharmaceutical preparations containing more than one vitamin. The effects attributed to these multiple agents cannot be evaluated accurately. The only hope of ascertaining fundamental data and bringing order out of this chaos is to abandon the use of compound vitamin preparations in experimental clinical work and employ only known quantities of single, pure substances.

Acting on this principle, we have conducted a series of experiments relative to the nature and therapeutic potentialities of the antineuritic vitamin B_1, so designated to indicate its origin in the old vitamin complex known as B. It is safe to assume that our results were due to this single substance, since we employed the pure crystalline material, of known molecular weight and formula.

The normal adult human intake of B_1 is said to be approximately 1 mg. daily, the richest sources being the bran coats of grains, leguminous seeds and lean pork. None of the concentrates on the market permit a liberal dosage of this vitamin without the ingestion of considerable amounts of inert or objectionable foreign matter. The pure crystals, which are now available, overcome this objection.

Read before the Section on Gastro-Enterology and Proctology at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 12, 1935.

Our first report [1] showed the striking increase in the growth rates of rats that received their supply of vitamin B_1 in the form of weighed amounts of the pure crystalline material. It was found that many factors influence the effect of a given amount of this vitamin, so that it is fallacious to speak absolutely of "the B_1 requirement" of a species, whether man or rat. The amount needed is indeterminate unless every component of the diet is fixed and well defined standards of function are specified. Besides these general considerations there is the factor of individual variation: an individual's requirements may far exceed the normal as a result of abnormalities in digestion and assimilation, impairment of glandular function by an infectious disease, changes resulting from a high carbohydrate intake, or special demands such as those of pregnancy and lactation.

Because true beriberi responds to remarkably small quantities of vitamin B_1, it has been assumed erroneously that a similar situation exists with respect to all B_1 deficiencies. We believe that the minimum therapeutic dose that can be relied on to abolish any accumulated deficit below normal storage capacity and supply current needs is 10 mg. daily. Adequate dosage is doubly important in view of the fact that the therapeutic response is often the main diagnostic test of the more obscure types of B_1 deficiency.

TABLE 1.—*Classification of Neuritides*

	Cases
Polyneuritis of infectious origin	20
So-called metabolic polyneuritis	41
Localized neuritis	22
Neuritis associated with anemia	11
Neuritis associated with pregnancy	3
Suspected advanced B_1 deficiency state	3
Total	100

The second stage of our experiment [2] dealt with the disturbance of the carbohydrate metabolism that has been reported repeatedly in experimental B_1 deficiency. Although a diminished carbohydrate tolerance is encountered in other abnormal states, it is most consistent and marked in B_1 avitaminosis.

The clinical syndrome of diabetes mellitus has many characteristics of a nutritional disturbance the etiology of which is still unknown. Proceeding on the hypothesis that a deficiency of B_1 may be a factor in the production and clinical course of this condition, an average of 10 mg. of this vitamin was administered, orally, daily for four consecutive weeks, to eleven patients with proved diabetes according to present-day standards. Six showed an increased utilization of carbohydrates; five did not. Of the positive cases, two are still maintaining the gain (after five and ten months respectively); two retained the increase for several months, and the remaining two reverted to their previous levels of blood and urinary sugar as soon as administration of the vitamin was stopped. Many factors pointed to a direct causal relationship between the intake of the vitamin and the increased carbohydrate tolerance in 54.6 per cent of the cases, with strong evidence that the action of B_1 in this condition is a catalytic one.

As B_1 is known specifically as the antineuritic vitamin, the third phase of our experiment, presented herewith, consisted of studies of the effects of this substance on a group of patients complaining of nerve pain. These neuritides have been divided, according to accepted clinical classifications, into the types given in table 1.

In table 2 the symptoms of these hundred cases are tabulated and the response to vitamin therapy described. Taking the series as a whole, only 8 per cent failed to react favorably; 44 per cent became entirely symptom free and 48 per cent were definitely improved. These cases have been under observation for periods ranging from three to fourteen months. Up to the present, no recurrence has been noted in any of the forty-four patients in the symptom-free group.

Among the 8 per cent who showed no improvement are several patients with proved organic pathologic conditions to explain their continued symptoms. They were included in this report, however, because their outstanding clinical manifestations were those of either localized or generalized neuritis and we felt that the presence of definite organic disease was no reason for the rejection of a case. From the beginning, we assumed that the antineuritic vitamin might have a nonspecific effect in neuritis, regardless of cause. With this in mind, it seemed of interest to determine whether or not the response of patients without demonstrable basis for the neuritic pain differed from that of patients with known organic disease.

When the cases are classified as to age and sex, it is seen that the number above and below 40 years is virtually the same. Almost three fourths of the patients were females, but allowance must be made for the fact that the series included three pregnancies, as well as eleven anemias of a type having a predilection for women.

It is of interest to note that 75 per cent of the cases demonstrated localized tenderness at one or more points related to pain. Almost invariably this tenderness dis-

TABLE 2.—*Analysis of One Hundred Cases of Neuritis Treated with Vitamin B_1 (Oral Administration)*

	Number of Cases	Symptom Free		Improved		Unimproved		Tenderness				Paresthesia				Anorexia				Weakness				Age		Sex	
								Present		Absent		Present		Absent		Present		Absent		Present		Absent		Under 40	Over 40	Male	Female
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	No.	No.	No.
1. Polyneuritis																											
A. Metabolic	41	14	34	24	58	3	7+	28	68	13	32	18	43	23	57	12	31	29	69	29	69	12	31	13	28	17	24
B. Infectious	20	10	50	9	45	1	5	16	80	4	20	8	40	12	60	8	40	12	60	11	55	9	45	9	11	4	16
C. With anemia	11	5	45	4	36	2	19	5	45	6	55	3	27	8	73	7	63	4	37	8	73	3	27	7	4	0	11
D. With pregnancy	3	3	100	..	..	..	..	3	100	..	..	..	..	3	100	..	..	3	100	..	..	3	100	2	1	0	3
E. Of unknown origin	3	1	33	2	67	..	..	3	100	..	..	2	67	1	33	3	100	..	..	3	100	..	..	2	1	1	2
2. Localized neuritis	22	11	50	9	41	2	9	20	91	2	9	7	32	15	68	3	14	19	86	4	18	18	82	16	6	7	15
Totals		44		48		8		75		25		38		62		33		67		55		45		49	51	29	71

1. Vorhaus, M. G.; Williams, R. R., and Keresztesy, J. C.: Studies on Crystalline Vitamin B_1: A Therapeutic Survey, read before the American Therapeutic Society, June 8, 1935.

2. Vorhaus, M. G.; Williams, R. R., and Waterman, R. E.: Studies on Crystalline Vitamin B_1: Observations in Diabetes, read before the American Gastro-Enterological Association, June 10, 1935. A complete bibliography is given by Cowgill, G. R.: The Vitamin B Requirement of Man, New Haven, Yale University Press, 1934.

appeared as the pain improved. The amelioration of associated symptoms, such as weakness, loss of appetite and paresthesia, far exceeded the relief of pain.

Since many of the acute neuritides subside spontaneously, the duration of symptoms must be considered in interpreting therapeutic results. The preponderant tendency toward chronicity in our cases is therefore noteworthy. In only 15 per cent had the symptoms been present for less than four weeks; in 50 per cent the duration ranged from one to twelve months; in 35 per cent it was over a year. Twelve per cent of the cases were of more than five years' standing, 23 per cent of one to five years', and 23 per cent of three to twelve months', making a total of 58 per cent in which symptoms had existed for more than three months. This element of time diminishes the probability of spontaneous recovery and appears to confirm the instrumentality of the vitamin therapy.

TABLE 3.—*Duration of Symptoms in One Hundred Cases of Neuritis Before Treatment*

	Up to 1 Week	1 to 4 Weeks	4 to 12 Weeks	3 to 12 Months	1 to 5 Years	Over 5 Years	Total
1. Polyneuritis							
(a) Metabolic	2	7	6	12	9	5	41
(b) Infectious	0	0	8	2	6	4	20
(c) With anemia	0	0	2	3	5	1	11
(d) With pregnancy	0	1	2	0	0	0	3
(e) Of unknown origin	0	0	1	2	0	0	3
2. Localized neuritis	1	4	8	4	3	2	22
Percentage	3	12	27	23	23	12	100

No claim is made of a "cure" in these cases — any more than it may be said that insulin "cures" diabetes. It is not illogical to assume, however, in an unknown percentage of the patients who were rendered symptom free and have remained so for a long time since the cessation of B_1 therapy that the neuritis may have been due solely to a B_1 deficiency; but this is pure speculation. At the present time there is no way of making such a clinical diagnosis with certainty. The only basis for this theory lies in the clinical response to B_1.

On the other hand, it seems apparent that B_1 has a nonspecific effect in neuritis if the forty-eight cases that were improved but not rendered entirely symptom free are studied. If there had been a B_1 avitaminosis in these patients their symptoms would have disappeared entirely on specific therapy in adequate amounts. Cannot their improvement be ascribed to the action of the vitamin, their failure to become completely well to the continued toxic effects of the original cause?

An analogy may be drawn with the action of iron in the anemias. Just as there is a small group of hypochromic anemias in whom the administration of adequate amounts of iron will result in a complete cure, it is conceivable that there may be a small group of neuritides (usually polyneuritis) in which the ingestion of vitamin B_1 brings about a thoroughly normal state, which is maintained after medication is stopped.

Carrying the analogy further, since the fact is recognized that large doses of iron will improve secondary anemias associated with a large variety of causes such as malnutrition, infection, metabolic diseases and even malignancy, why cannot it be assumed that adequate amounts of B_1 may stimulate reparative processes in the neuraxon, resulting in progress toward the normal state, even in the absence of a B_1 deficiency and regardless of the continued presence of neurotoxins?

An additional series of eight cases, all proved by roentgen examination to be hypotonia of the gastrointestinal tract for which no organic cause could be demonstrated, was also studied. Three males and five females comprised this group, ranging in age from 19 to 37 years. All complained of marked loss of appetite. There were definite localized or generalized pains in six. In seven, the duration of the constipation was upward of four years; the remaining patient gave a history of alternating diarrhea and constipation for many years.

Since the combination of anorexia and gastrointestinal hypotonia has been observed in experimental animals known to have a B_1 avitaminosis, it was decided to study the effects of B_1 in this group. In all cases, normal appetite returned and the weakness disappeared. Six of the eight experienced a complete restoration of normal bowel function, continuing after medication was stopped. The remaining two showed a marked improvement in elimination, although occasional constipation occurred even during administration of the vitamin. Pain disappeared entirely in five cases and was greatly improved in one.

Reviewing the results in this brief series, it is important to emphasize that these eight patients represent a carefully selected group, in contrast to the neuritic cases, which were accepted at random. We had already observed in the latter that relief of the neuritic pain was not associated with any improvement in the bowel function of those patients suffering from coexisting constipation, so that we had no delusions of dealing with an efficacious constipation remedy. What was sought was a clinical counterpart of the condition of generalized gastro-intestinal hypotonia and marked anorexia that has been observed frequently in experimental animals with B_1 deficiency. The small series reported herewith presents a similar syndrome. There is no doubt that this type of case represents only a minute fraction of the patients with constipation who are observed clinically.

TABLE 4.—*Analysis of Eight Cases of Unexplained Gastro-Intestinal Hypotonia with Anorexia* *

Name	Sex	Age	Bowel Function	Anorexia	Weakness	Neuritic Pain	Vitamin Therapy, Mos.	Result
A. D.	♀	31	Constipation since infancy	+++	+++	+	4	Bowels regular; no pain; appetite normal
C. E.	♂	33	Alternating diarrhea and constipation	++	0	+	2	Bowels regular; no pain; appetite normal
F. G.	♀	17	Constipation for 4 years	+++	++	+	3	Bowels regular; no pain; appetite normal
R. H.	♀	37	Constipation for 10 years	+++	+++	+	5	Bowel function much improved; appetite normal; no pain
P. L.	♂	34	Constipation for 8 years	++	+	+	6	Bowels regular; no pain; appetite normal
B. S.	♀	27	Constipation for 6 years	++	++	+	12	Bowel function much improved; appetite normal; no pain
A. F.	♀	19	Constipation since infancy	+++	+	0	2	Bowels regular; appetite normal
R. S.	♂	33	Constipation for 15 years	++	+	0	2	Bowels regular; appetite normal

* Roentgen examination in all cases revealed generalized gastrointestinal hypotonia without any demonstrable causes present.

In view of the large proportion of cases in these studies in which the administration of vitamin B_1 resulted in an amelioration of symptoms, it seems logical to assume that deficiency states are far more frequent than has been thought heretofore. The fact

that most of these cases have not been recognized as such indicates the need for some clinical method of differentiating the various stages of B_1 avitaminosis that will embrace the lesser as well as more intense states. We have attempted to formulate such a concept of vitamin B_1 deficiency in human beings. This is, admittedly, in the formative stage and far from final; but we believe that the time has come, with the material and observations at our disposition, to attempt to define the several clinical phases of B_1 avitaminosis. Recognizing that further research will unquestionably necessitate some revision, we suggest the following tentative basis for continued study:

1. The state of total (?) deficiency of vitamin B_1 that is known clinically as beriberi is well recognized. It is characterized by weakness, pains in the extremities followed by paralysis of the legs, fever, anorexia, diarrhea or constipation, signs of myocardial insufficiency, secondary anemia and, at times, marked edema (dry or wet form). If untreated, it usually results in death, frequently sudden (acute cardiac type).

2. The next most advanced stage, that of severe deficiency of vitamin B_1, is also recognizable clinically as a state of avitaminosis. Its symptoms are weakness, severe persistent pain in the extremities, paresthesia, anorexia and mild signs of myocardial insufficiency. Sometimes it is associated with edema of the legs and a history of dietary restriction (nutritional edema). In the tropics it is frequently diagnosed as rudimentary beriberi: it may develop into typical beriberi or subside spontaneously.

3. The third stage, continuing in the direction of diminishing severity, is the advanced deficiency of vitamin B_1, recognized clinically as polyneuritis. Here the principal symptoms are weakness, anorexia and severe pain in one or more of the extremities or elsewhere in the body. This type is sometimes classified as alcoholic polyneuritis or toxic neuritis. It may be associated with bacterial infections, alcoholism, gastrointestinal disease or a deranged carbohydrate metabolism. In some cases it is possible that the deficiency is due less to an insufficient supply of the vitamin than to inadequate absorption.

4. The state of moderate deficiency of vitamin B_1 is usually unrecognized clinically. The symptoms include localized, persistent pain, usually in an extremity or in the back, and anorexia. Paresthesia is frequently present. There is little or no weakness. This condition is usually associated with obesity and a disturbed carbohydrate metabolism. It is frequently classified as diabetic or metabolic neuritis.

5. The least severe stage, mild deficiency of vitamin B_1, also goes unrecognized. There are vague pains, usually elicited only by pressure over the nerve roots, general malaise, anorexia and constipation. Small amounts of sugar may be present in the urine, without hyperglycemia. There is usually a large carbohydrate intake, often associated with a tendency to obesity. These cases are frequently classified as potential diabetes.

At the present time, as already stated, only the most severe forms of B_1 avitaminosis are wont to receive clinical recognition. In view of the frequent occurrence of lesser degrees of B_1 deficiency, as indicated by an accumulating mass of evidence, a concerted effort should be made to clarify the clinical boundaries that demarcate its various stages. This requires extended research, which will yield reliable results only if known quantities of the pure substance are used in therapeutic tests. As an aid to further study, the pathologic states in which we believe the administration of vitamin B_1 is indicated are presented:

1. Beriberi.
2. Suspected beriberi.
3. Polyneuritis:
   (*a*) Alcoholic.
   (*b*) Infectious.
   (*c*) Toxic.
   (*d*) So-called metabolic.
   (*e*) Associated with anemia.
   (*f*) Associated with pregnancy.
4. Disturbances of the carbohydrate metabolism (including cases now classified as diabetes mellitus).
5. Localized neuritis, resistant to usual therapy.
6. Unexplained anorexia and gastro-intestinal hypotonia.

CONCLUSIONS

1. There is evidence to suggest frequent deficiency of vitamin B_1 in the human dietary.

2. At the present time only the state of extreme vitamin B_1 deficiency is usually diagnosed. Lesser degrees of B_1 avitaminosis in human beings rarely receive clinical recognition.

3. Experimental results indicate that amounts of B_1 greater than the quantity necessary to protect against extreme deficiency (i. e., beriberi) produce beneficial effects in lesser deficiencies in both animals and man.

4. Results of a previous study indicate a relationship between vitamin B_1 deficiency and disturbances of the carbohydrate metabolism.

5. In a study of 100 cases of clinical neuritis in which vitamin B_1 was administered orally, forty-four were rendered symptom free, forty-eight were improved and eight showed no benefits.

6. In a group of eight cases of unexplained gastrointestinal hypotonicity and anorexia, six became free from all symptoms on ingestion of vitamin B_1; two were improved.

7. The use of a single agent—pure vitamin B_1—is urged in the study and treatment of suspected B_1 avitaminosis.

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ABSTRACT OF DISCUSSION

DR. FREDERICK F. TISDALL, Toronto: So many of us have been accustomed to thinking of a deficiency of vitamin A as showing itself only as xerophthalmia, of B_1 as beriberi, of C as scurvy or of D as rickets, that we frequently lose sight of the fact that a relative deficiency of any one of these vitamins, if carried on over a sufficient length of time, will result in other and just as important signs of ill health. The authors have reported that in 100 cases of nerve pain they obtained improvement and cure by the administration of crystalline vitamin B_1. How is it that any one could run into such a large number of cases that have formerly not been recognized in which there is a deficiency of this food element? At the Department of Pediatrics of the University of Toronto we took two groups of children in one institution and fed to one group a small amount of a vitamin B_1 and B_2 concentrate and observed their growth. These children were on an excellent diet the same as any one might recommend to one's patients, built up around milk, meat, eggs, vegetables and fruit. The normal children getting the additional B_1 and B_2 grew at a considerably faster rate than those not getting it. This is evidence that children on our present-day excellent diet are not getting an optimal amount of this food element. In view of the fact that in one's diet today from 30 to 40 or even 50 per cent of the calories consumed are supplied by purified food substances, purified flours and sugars that contain no vitamin B_1, it is obviously deficient in this vitamin. Although vitamin B_1 is widely dis-

tributed in milk, eggs, liver, kidney, vegetables and fruit, it is not abundantly distributed. The work done has shown that in the cooking of vegetables more than 50 per cent of the B_1 vitamin present may be lost. It is not destroyed by heat, but it is destroyed by going into solution in the water that is thrown away. When one stops to consider that the diet is made up of from 30 to 50 per cent of food that contains no vitamin B_1 and from food cooked in water that is thrown away, one can see how the amount of vitamin B_1 necessary for optimal health is not obtained.

DR. MARTIN G. VORHAUS, New York: I want to add one point to the discussion of the frequency of B_1 deficiency. It is one of the few vitamins that the experimental workers in the field believe is not stored in the body, so that, without the normal protection of storage that exists with other vitamins, the probability of a deficiency state is that much more frequent; secondly, experimental workers have shown, and our clinical experience is along the same line, that there is some relation between the degree of carbohydrate intake and the utilization of the vitamin; i. e., the larger the carbohydrate intake, the greater the demand for vitamin B_1 in the human and animal body. Consequently a depletion of B_1 will take place more rapidly on a high carbohydrate diet than it will on a low carbohydrate diet.

DIURETIC ACTION OF POTASSIUM SALTS

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For two centuries certain potassium salts have been employed as diuretics in clinical medicine. In 1679 Thomas Willis [1] recommended the use of potassium nitrate or "salt of niter" in the treatment of dropsy. Wilks and Taylor [2] used it successfully in 1863. In 1921 Blum [3] and Magnus-Levy [4] were able to show that potassium chloride could be administered safely by mouth in relatively large doses and that it produced frequently a satisfactory diuresis. Since then, McCann and his co-workers,[5] Osman [6] and Barker [7] have obtained similar results with potassium citrate, bicarbonate and chloride. Barker emphasized the importance of giving a diet in which the sodium content was low and that of potassium relatively high. It occurred to us in 1932 that potassium nitrate might be the salt of choice, if potassium itself should have an additional diuretic action to the well known effect of the nitrate radical. We then outlined the present study, which included observations on the relative effect of different potassium salts in both the normal individual and patients having various types of dropsy.

From the Division of Medicine, the Mayo Clinic.

Owing to lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the authors' reprints.

Read before the Section on Pharmacology and Therapeutics at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 14, 1935.

1. Willis, Thomas: Pharmaceutice Rationalis, London, C. Dring, C. Harper and J. Leigh, 1679, p. 74.

2. Wilks, Samuel, and Taylor, A. S.: A Case in Which a Large Quantity of Nitrate of Potash Was Taken Medicinally: Elimination of This Salt by the Urine: With Remarks, Guy's Hosp. Rep. **9**: 173-179, 1863.

3. Blum, Léon: Recherches sur le rôle des sels alcalins dans la pathogénie des oedèmes: l'action diurétique du chlorure de potassium, Presse méd. **28**: 685-688 (Sept. 29) 1920.

4. Magnus-Levy, A.: Alkalichloride und Alkalikarbonate bei Oedemen, Deutsche med. Wchnschr. **46**: 594-596 (May 27) 1920.

5. Basset, Samuel; Elden, C. A., and McCann, W. S.: The Mineral Exchanges of Man: II. Effect of Excess Potassium and of Calcium on Two Normal Men and on an Edematous Nephritic, J. Nutrition **5**: 1-27 (Jan.) 1932.

6. Osman, A. A.: Studies in Bright's Disease: The Use of Alkalis in the Treatment of Bright's Disease and Their Prophylactic Value in This and Other Conditions Associated with Impairment of Renal Function, Guy's Hosp. Rep. **77**: 386-435 (July-Oct.) 1927.

7. Barker, M. H.: Edema as Influenced by a Low Ratio of Sodium to Potassium Intake: Clinical Observations, J. A. M. A. **98**: 2193-2197 (June 18) 1932.

ACTION OF POTASSIUM SALTS ON THE NORMAL INDIVIDUAL

In previous studies [8] on the action of acid-forming salts our procedure was to give normal individuals a measured amount of a given salt under strict experimental conditions and to compare the urinary output of water and other constituents with that in control periods before and after the ingestion of the salt. The weighed diet was low in water and mineral content, particularly as to chloride and sodium. It was calculated to be sufficient in calories and protein to keep the individual in nitrogen balance. The intake of fluid, in addition to that in the food, was limited to 800 cc. daily. The experiment extended over a period of from ten to fourteen days, a specific salt being given on five of these days. The potassium salts given were potassium chloride, bicarbonate, nitrate, acetate and citrate. Sodium chloride was given in a single experiment, chiefly to bring out by contrast the relative effects of the potassium and sodium radicals. The salts were administered in 25 per cent solution in a single dose of from 7.5 to 14 Gm. (0.13 to 0.2 Gm. per kilogram of body weight). All five potassium salts produced diuresis with loss of weight (charts 1 and 2).

The sudden decrease in the excretion of water and minerals after discontinuing administration of the salt was a striking finding in each experiment. The nitrate caused a relatively greater diuresis than any of the other salts. The chloride was next in efficiency, and still less efficient were the bicarbonate, acetate and citrate. The nitrate also caused a greater excretion of chloride and sodium than the bicarbonate, acetate and citrate. Potassium was readily excreted after the ingestion of all five salts.[9] The concentration rose from 0.50 to 0.96 Gm. per hundred cubic centimeters. Thus even with diuresis the normal kidney excreted a urine in which the concentration of potassium reached a figure approximately fifty times greater than that of the blood serum. Such results indicate that potassium concentration by the kidney is similar to that of creatinine, urea and sulphate. It is obviously concentrated in a much greater degree than sodium. The excretion of calcium remained unaltered throughout these experiments. A decrease in ammonia nitrogen, and an increase in the excretion of bicarbonate along with a rise in p_H, invariably occurred after the ingestion of potassium bicarbonate, acetate and citrate. These results are similar to those reported with sodium bicarbonate, carbonate and citrate.[10] Changes in the excretion of total nitrogen and inorganic sulphates and phosphates were not uniform and were difficult to interpret. Each twenty-four hour specimen was tested qualitatively for protein, and the result was invariably negative.

The results in subject V (chart 1) after taking sodium chloride are in sharp contrast to those after taking potassium salts. There is an early retention of water, chloride and sodium with a gain in body weight. Later there is an increased excretion of these con-

8. Keith, N. M., and Whelan, Mary: A Study of the Action of Ammonium Chloride and Organic Mercury Compounds, J. Clin. Investigation **3**: 149-202 (Oct.) 1926. Keith, Whelan and Baunick.[31]

9. Potassium was estimated by the Kramer and Tisdall methods in blood serum and urine. Any serum suggesting the presence of hemolysis was discarded. (Kramer, Benjamin, and Tisdall, F. F.: A Clinical Method for the Quantitative Determination of Potassium in Small Amounts of Serum, J. Biol. Chem. **46**: 339-349 [April] 1921. Tisdall, F. F., and Kramer, Benjamin: Methods for the Direct Quantitative Determination of Sodium, Potassium, Calcium and Magnesium in Urine and Stools, ibid. **48**: 1-12 [Sept.] 1921.)

10. Stadelmann, Ernst: Ueber den Einfluss der Alkalien auf den menschlichen Stoffwechsel, Stuttgart, F. Enke, 1890, 176 pp.

stituents and a slight fall in weight. These results simply confirm many similar previous experiments with sodium salts.[11]

In all of our eight experiments with normal individuals (colleagues who kindly consented to undergo the tests), the serum potassium was estimated before the ingestion of the given salt, sometime during its ingestion, and after its administration was discontinued.

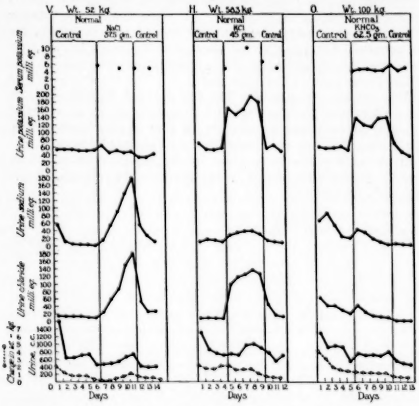

Chart 1.—Normal subjects V., H. and O., showing daily excretion of water, chloride, sodium and potassium in the urine and the concentration of potassium in the serum after they had ingested sodium chloride, potassium chloride and potassium bicarbonate.

The sample of serum was withdrawn in the morning at the end of the twenty-four hour period. No change was observed in the serum of subject V, who received sodium chloride. This constituted a control for the seven individuals who were given potassium salts. In the latter, the potassium of the serum either rose a few milligrams or, as in M. (chart 2), T. and H. (chart 1), increased distinctly to 33, 37 and 40 mg. per hundred cubic centimeters, or 8.4, 9.5, 10.2 milliequivalents, respectively.[12] No toxic symptoms were noted in any of the seven individuals. Thus, in seven normal subjects under the same experimental conditions, including diet and intake of fluid, the potassium was readily absorbed and excreted, yet the concentration of the serum varied only from 20 to 40 mg. per hundred cubic centimeters (5.1 to 10.2 milliequivalents). Further study is necessary to explain these variations in the concentration of the serum.

In order to study the initial effects produced by administration of potassium salts, two short experiments, nine hours in duration, were carried out with two normal individuals, K. and B. (chart 3). No food was taken for twelve hours preceding or during the experiment; however, 600 cc. of water was ingested during the experiment. A control specimen of urine was collected from 7 to 8 a. m. At 8 a. m., 12.5 Gm. of potassium acetate or nitrate was ingested and specimens of urine were collected at 8:15, 8:30, and 9 o'clock, and subsequently at hourly intervals for the next seven hours. Specimens of venous blood were withdrawn frequently during the experiment. After potassium acetate was taken by subject K. there was an increase in the renal excretion of water, chloride, carbonate and potassium; the p_H of the urine rose from 5.9 to 8.3. The changes in the blood were a small increase in the carbon dioxide capacity of the plasma, from 62 to 69 volumes per cent, and a slight rise in the serum concentration of potassium, from 18 to 20 mg. per hundred cubic centimeters, 4.6 to 5.1 milliequivalents. The concentration of potassium in the urine rose to 0.95 Gm. per hundred cubic centimeters, or fifty times that of the serum. After deducting the probable excretion of potassium by a starving individual, estimated from the excretion on the first day of a prolonged fast by Benedict's subject,[13] this individual excreted 49 per cent of that ingested in eight hours.

The experiment with subject B. was similar in every detail to that with K. with the single exception that the same amount of potassium nitrate was ingested instead of potassium acetate. The results were in many respects similar, although there was a relatively greater diuresis and a greater excretion of chloride and potassium than in the previous experiment. The p_H did rise, but it fluctuated quite markedly from specimen to specimen. The changes in the blood were: (1) a slight decrease in the carbon dioxide capacity of the plasma, from 66 to 55 volumes per cent, and (2) a small rise in the concentration of potassium in the serum from 18 to 23 mg. per hundred cubic centimeters (4.6 to 5.9 milliequivalents). The maximal concentration of potassium in the urine was 0.76 Gm. per hundred cubic centimeters, or forty-two times that of the serum. This is a slightly lower figure than in the previous experiment and is probably to be accounted for by the greater

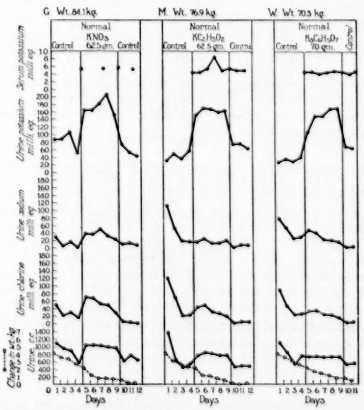

Chart 2.—Normal subjects G., M., and W., showing daily excretion of water, chloride, sodium and potassium in the urine and the concentration of potassium in the serum after they had ingested potassium nitrate, potassium acetate and potassium citrate.

increase in the volume of urine. The calculated percentage excretion of potassium ingested was 64. A routine qualitative test for protein was made in each specimen of urine in these two experiments, and no protein was demonstrated.

11. Blum, Léon: Ueber die Rolle von Salzen bei der Entstehung von Oedem Verhandl. d. Kong. f. inn. Med. 122-126, 1909. Meyer, L. F.: Verhandl. d. Versamml. d. Gesellsch. f. Kinderh. **14**: 1909.

12. Twenty milligrams per hundred cubic centimeters of potassium, a mean normal figure = 5.1 milliequivalents per liter.

13. Benedict, F. G.: A Study of Prolonged Fasting, Washington, Carnegie publication 203, 1915.

These two short experiments indicate that potassium salts are promptly absorbed and readily excreted and that the changes in blood and urine are very similar to those obtained in the previous experiments extending over a period of several days.

ACTION OF POTASSIUM SALTS ON PATIENTS WITH EDEMA

During the last three years we have administered potassium salts to sixty patients with edema. Twenty-nine patients had chronic nephritis with edema, twenty had myocardial degeneration with decompensation, seven had cirrhosis of the liver with ascites and edema, one had polyserositis with tuberculosis of the peritoneum, and in three cases there was edema of indeterminate origin. The diuretic results were very satisfactory in twenty-nine cases (48 per cent), fair in twenty (33 per cent), and a failure in eleven (18 per cent). An increased urinary output was thus observed in 80 per cent of the cases. In four cases quantitative studies similar to those just described for normal subjects were carried out.

Case 1 (subject A., chart 4).—A youth, aged 19 years, who had had albuminuria and edema for five weeks, was given potassium chloride. Preliminary examination showed that he had a moderate degree of general edema, some anemia, with a hemoglobin concentration of 11.1 Gm. per hundred cubic centimeters, and erythrocytes numbering 3,560,000 per cubic millimeter. The urinary changes were characteristic of subacute glomerulonephritis and there were definite renal functional disturbances. The blood pressure was usually normal and the ocular fundi showed no abnormalities. The values for certain constituents of the blood are given in the accompanying table.

Following the exhibition of a weighed diet consisting of from 1,600 to 2,500 calories, 40 to 50 Gm. of protein, a low mineral and water content, 600 cc. of extra fluid, and 105 Gm. of potassium chloride in thirteen days, the edema disappeared and the patient's weight decreased 24 pounds (11 Kg.). Diuresis was indicated by a rise in the daily volume of urine from 600 to 1,480 cc. There was an increased excretion of chloride, sodium and potassium. The potassium concentration rose to 0.41 per cent, seventeen times the concentration in the serum. The total output of sodium was relatively much greater than that of potassium. The comparatively small urinary output of potassium indicated that potassium was retained in considerable quantity. The amount of potassium excreted in the stools and sweat obviously could not account for this marked discrepancy between intake and urinary output. This result suggested replacement of sodium by potassium in the tissues. Throughout diuresis the daily excretion of protein in the urine was from 1.5 to 5.2 Gm. per hundred cubic centimeters.[14] At the time the patient was free from edema, the analysis of the chemical constituents of the blood indicated a slight reduction in the plasma alkali reserve, but otherwise there was an improvement in renal function. In spite of a retention of potassium the rise in serum concentration was slight.

Case 2 (subject G, chart 4).—A woman, aged 24, gave a history of albuminuria for one year and of general edema for six months. On examination there was no gross anemia, but there was slight puffiness of the eyelids and moderate edema of the lower part of the back and legs. The blood pressure in millimeters of mercury was 105 systolic and 75 diastolic, and the ocular fundi appeared normal. Routine urinalyses revealed a heavy precipitation of albumin, a few hyaline casts and a few leukocytes, but no erythrocytes. Values for certain constituents of the blood are given in the table. A diagnosis of chronic glomerulonephritis with features of chronic lipoid nephrosis was made.

Results of Examination of the Blood of Various Subjects

				Whole Blood			Plasma			Serum					
Subject	Chart	Potassium Salt Given	Diuresis	Hemoglobin, Gm. per 100 Cc.	Urea, Mg. per 100 Cc.	Chloride,* Mg. per 100 Cc.	Carbon Dioxide Combining Power, Volumes per Cent	Nitrate Nitrogen, Mg. per 100 Cc.	Cholesterol, Mg. per 100 Cc.	Protein, Gm. per 100 Cc.	Albumin, Gm. per 100 Cc.	Sulphate, Mg. per 100 Cc.	Sodium, Mg. per 100 Cc.	Potassium, Mg. per 100 Cc.	Calcium, Mg. per 100 Cc.
A.	4	Potassium chloride	Before	11.1	72	627	47	...	340	4.1	1.7	11.0	...	..	...
			During	....	42	668	40	...	...	...	...	8.4	330	24	...
			After	....	40	627	43	...	268	3.6	0.9	8.5	340	23	...
G.	4	Potassium nitrate	Before	14.9	90	627	..	...	595	4.6	1.9	6.0	...	..	...
			After	....	22	585	59	4.1	512	4.3	1.9	...	318	19	8.1
S.		Potassium nitrate	Before	12.6	22	627	47	...	133	2.7	1.4	3.5	387	18	6.5
			During	....	21	627	48	0.7	...	3.1	1.9	4.3	301	24	8.3
			After	14.4	18	618	54	...	181	3.4	2.4	5.6	296	18	8.5
Pe.†	5	Potassium chloride	Before	13.7	22	585	51	...	...	...	...	5.2	310	20	...
			During	....	..	....	..	...	....	...	...	...	310	37	...
			After	13.5	22	593	46	...	...	...	...	5.6	327	20	...
Pw.		Potassium nitrate	Before	13.7	40	600	46	...	476	3.4	1.2	6.8	....	10	...
			After	....	33	561	53	...	...	...	...	...	...	..	...
B.	6	Potassium nitrate	Before	....	100	...	..	...	...	...	...	...	...	..	...
			After	....	26	...	..	...	...	...	...	...	...	..	...

* Calculated as NaCl.
† Very slight or no diuresis occurred in this case (chart 5).

Treatment consisted of a weighed diet of 2,500 calories, 77 Gm. of protein, a low mineral and water content and 600 cc. of extra fluid, and potassium nitrate, 12 Gm. (0.2 Gm. per kilogram of body weight) daily. Mild diuresis followed, with a loss of weight of 15 pounds (6.8 Kg.) in five days. The patient was now free from visible edema. The diuresis was accompanied by a considerable increase in the excretion of potassium, chloride and nitrate, but by a relatively small increase in sodium. The concentration of potassium rose to 0.95 Gm. per hundred cubic centimeters, or fifty times that of the serum. These results in regard to the relative amounts of sodium and potassium excreted are somewhat the reverse of the results in case 1 (subject A.). The excretion of calcium was extremely small. The daily output of protein was considerable, varying from 5.2 to 8.2 Gm. Both in this and in the previous case the presence of a considerable amount of protein in the urine did not seem to hinder the diuretic response, nor was the function of the kidney further impaired. At the termination of diuresis the changes in the blood were a slight retention of nitrate, without retention of potassium or a notable shift in the alkali reserve.

Case 3 (subject S. in the table).—A married woman, aged 35, complained chiefly that for six months she had had edema of the feet, legs and face. On physical examination there was no

14. The protein in the urine was determined by subtracting the nonprotein nitrogen from the total nitrogen and by multiplying the result by 6.25. The nonprotein nitrogen was estimated after precipitating the protein with Folin's tungstic acid reagent.

demonstrable anemia. The blood pressure was 100 systolic and 60 diastolic. There was definite edema of the feet, legs and lumbosacral region, reaching as high as the eighth thoracic vertebra. Further studies showed that there were no abnormal constituents in the urine, which included examination for lipoid bodies. The basal metabolic rate was +2. The serologic test for syphilis was negative. All tests of renal function gave normal readings. However, the concentration of serum protein was very greatly reduced, to 2.7 Gm., the albumin content to 1.4 Gm. and the calcium content to 6.5 Mg. per hundred cubic centimeters, as shown in the table. Edema fluid obtained through a needle inserted in the leg was water clear and contained only 0.1 per cent of protein. A diagnosis of an indeterminate type of edema associated with hypoproteinemia was made.

Treatment consisted of a weighed diet of approximately 2,000 calories, from 80 to 100 Gm. of protein, and a low mineral and water content. Extra fluid was limited to 800 cc. Nine grams of potassium nitrate was administered daily for fourteen days and, because of the low serum calcium from the fifth to the fourteenth day, 12 Gm. of calcium lactate was also given daily. On this regimen diuresis developed, the volume of urine varying from 900 to 2,080 cc. There was an increased excretion of chloride, nitrate, sodium and potassium. The concentration of potassium increased to 0.41 Gm. per hundred cubic centimeters, seventeen times that of the serum. A slight increase in calcium output occurred. No demonstrable amount of protein was excreted during this experimental period. When the patient became edema free, she had lost 14 pounds (6.4 Kg.).

The noticeable changes in the blood were the considerable rise in serum protein and albumin and calcium contents. During diuresis the serum potassium rose to 24 mg. per hundred cubic centimeters (6.2 milliequivalents), but it fell to 18 mg. (4.6 milliequivalents) at the termination of the diuresis. Similarly, the plasma nitrate rose to 0.7 mg. per hundred cubic centimeters during diuresis.

CASE 4 (subject Pe., chart 5).—A man, aged 58, a city clerk, had always been a heavy drinker of alcohol, and five months before admission the abdomen had become swollen. During the last four months abdominal paracentesis was performed on five occasions, several liters of fluid being drained at each operation. The patient's ankles had been swollen for three

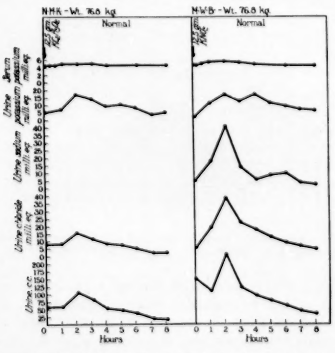

Chart 3.—Normal subjects K. and B., showing hourly excretion of water, chloride, sodium (B.) and potassium in the urine and the concentration of potassium in the serum after they had ingested potassium acetate and potassium nitrate.

months. On examination there was evidence of fluid in the left pleural cavity, marked ascites was present, and there was moderate edema of the lumbosacral region and of the legs. There were no definite evidences of myocardial insufficiency. Secondary anemia was slight. Routine urinalyses and tests of renal function were essentially normal. The serologic test for syphilis was negative. The dye test of hepatic function revealed marked retention in the blood, and the serum bilirubin was 2.5 mg. per hundred cubic centimeters (direct reaction). A provisional diagnosis of hepatic insufficiency, cirrhosis (?), ascites and left pleural effusion was made. The etiology of the patient's disease remained obscure. Treatment consisted of paracentesis of the left pleural cavity on three occasions and of the abdominal cavity twice. Fluid in the amount of 12,500 cc. was removed in this manner. After paracentesis a firm edge, presumably of the liver, was palpated 6 cm. below the right costal margin. The results of examination of the blood are given in the table.

For a period of twelve days the patient was given a weighed diet consisting of from 1,335 to 2,350 calories, 35 to 49 Gm. of protein, and a low intake of minerals and water. Extra fluid was limited to 800 cc. The patient also ingested potassium chloride, 5 Gm. daily. On this regimen there was a loss in weight of 2 Kg., probably due to withdrawal of 1,000 cc. from the left part of the chest and 2,500 cc. from the peritoneal cavity, a decrease in the dependent edema and at times a slight increase in the volume of urine, but no actual and steady diuresis. The excretion of chloride and potassium was increased, the concentration of the latter rising to 0.6 Gm. per hundred cubic centimeters. The excretion of sodium was very small and was uniform throughout. On the seventh day the serum potassium rose to 37 mg. per hundred cubic centimeters (9.1 milliequivalents), but later fell to the initial figure of 20 mg. (5.1 milliequivalents). In this case there occurred a distinct retention of potassium and a slight decrease in the alkali reserve, even though the dose of potassium chloride was small.

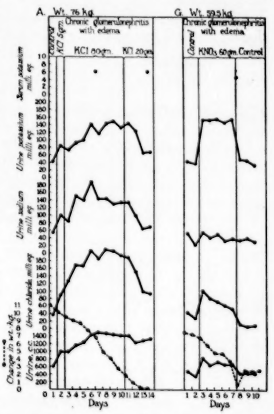

Chart 4.—Subjects A. and G., showing daily excretion of water, chloride, sodium and potassium in urine and the concentration of potassium in the serum after they had ingested potassium chloride and potassium nitrate.

Two further cases are of interest because of the excellent diuretic response obtained. Detailed chemical analyses of the urine were not made as in the previous four cases.

CASE 5 (subject Pw. in the table).—A farmer, aged 39, when admitted to the clinic stated that his illness had begun eight months previously with general edema and albuminuria. A diagnosis of chronic glomerulonephritis with edema was made.

CASE 6 (subject B., chart 6).—The patient was a rancher, aged 56. A diagnosis of myxedema, myocardial degeneration with decompensation, and renal insufficiency was made.

DOSE OF POTASSIUM SALTS

The amount of a given salt administered in order to produce diuresis is considerably greater than the dose given in the United States and British pharmacopeias. Taking 12.5 Gm. of potassium nitrate as a useful standard daily dose, we gave to normal individuals, for comparative purposes, approximately its atomic equivalent of the other potassium salts. The content of potassium was about 5 Gm. This amount has been the usual maximal dose given to patients with edema. However, subject H. was given 24.5 Gm. of potassium salts, 12 Gm. of nitrate, and 12.5 Gm. of the bicarbonate, daily, for a period of thirteen days. The

potassium content amounted to 9.5 Gm. daily. No ill effects were observed. Similar maximal daily doses of the chloride, nitrate, bicarbonate, acetate and citrate have been successfully employed previously by Blum,[3] Wilks and Taylor,[2] Nonnenbruch,[15] Fleckseder,[16] and Basset, Elden and McCann.[5] Their doses varied from 16.5 to 30 Gm. of the salt and from 6.6 to 13 Gm. of potassium.

Caution must be used in administering these large doses, and all are agreed that smaller trial doses should be given initially. Our plan has been to give from 6 to 12 Gm. of potassium nitrate, or its atomic equivalent in other potassium salts, daily to a given subject, the exact dose depending on the individual's needs and condition. A simple clinical danger signal is the absence of diuresis after administering a salt for a few days. Some patients were able to take 10 per cent solutions of a salt, or the salt itself on food, without discomfort. Others complained of epigastric discomfort or even nausea. Potassium nitrate, 0.5 Gm. in the form of an enteric coated pill, has been the most satisfactory method of administering any one of these salts. The combined use of potassium salts and other diuretics, such as the organic compounds of mercury and the caffeine-containing compound aminophylline, sometimes has produced excellent results. The combined effect is similar to that of the acid-producing salts and organic mercury and these salts and caffeine compounds.

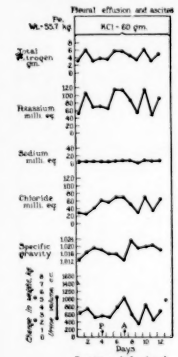

Chart 5.—Subject Pe., showing daily excretion of water, chloride, sodium, potassium and total nitrogen in the urine after ingestion of potassium chloride. Paracentesis of left pleura at *P* and of peritoneal cavity at *A*.

TOXIC ACTION

Potassium salts, when injected intravenously into animals, can cause rapid toxic effects, particularly on the heart. The experiments of Blake,[17] Grandeau [18] and Traube [19] carried out years ago are often quoted to emphasize this fact. Mathison [20] in 1911 was able to show that potassium chloride, when injected into the central portion of the carotid artery of the cat, not only was less toxic but actually caused a rise in blood pressure in contrast to a fall after intravenous injection. He attributed the toxic action after intravenous injection to the high concentration of potassium, which almost at once reaches the heart muscle. Amberg and Helmholz [21] in 1916 determined the toxicity of intravenously injected potassium chloride and sulphate in the guinea-pig. They found that the lethal dose was very small, from 10 to 17.5 mg. per hundred grams of body weight, when the solutions, 1 per cent potassium chloride and 1.75 per cent sulphate, were injected at the rate of 1 cc. per minute. A much larger dose was necessary to kill the animal if it had received a previous injection of sodium chloride. In 1925 Whelan,[22] studying some biochemical effects of intravenously injected chlorides in dogs, noted that seven animals, when given 0.1 Gm. of potassium chloride per kilogram of body weight, in ten minutes showed no obvious toxic effects. Such results seem to show that slowing the rate of injection is an important factor in protecting the heart from too concentrated a solution of the potassium salt. Two experiments reported by Nicholson and Soffer [23] early this year also support the view that slow intravenous injections can be much better tolerated than rapid ones.

What is the concentration of potassium in the blood serum that is toxic to the heart? McLean, Bay and Hastings [24] have recently carried out a series of perfusion experiments on the isolated heart of the rabbit and found that when the concentration of potassium in the perfusion fluid was increased to 48 mg. per hundred cubic centimeters (12.0 milliequivalents per liter) ventricular fibrillation and minimal ventricular contractions were observed. These results support Cushny's statement [25] that a concentration of potassium in the serum of greater than about 50 mg. per hundred cubic centimeters (12.8 milliequivalents) is highly poisonous to the heart. The highest concentration of potassium in the serum of our normal controls and of patients when taking potassium salts has been 40 mg. per hundred cubic centimeters (10.2 milliequivalents), or well under this figure. Rabinowitch,[26] however, reported serum concentration of 58 and 72 mg. per hundred cubic centimeters (14.9 and 18.5 milliequivalents) in two cases, one of eclampsia and the other of uremia, but he does not mention any outspoken and noticeably toxic effect on the heart. Magnus-Levy [4] and others have stressed that toxic effects produced during a perfusion experiment may not necessarily occur in the intact animal.

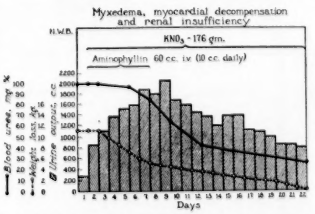

Chart 6.—Subject B., showing daily volume of urine and changes in blood urea and body weight after ingestion of potassium nitrate.

We believe that the results of experimental studies on animals contraindicate, at present at least, the intravenous administration of any considerable amount of

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potassium salts in clinical medicine. On the other hand we have shown that normal individuals can take a large dose of a potassium salt by mouth without demonstrable toxic effects. Many observers have given really enormous doses of potassium salts for a considerable period to patients with edema and no untoward effects have occurred. In our present series subject H., previously mentioned, took by mouth 871 Gm. of potassium salts (358 Gm. of potassium) in a period of sixty-eight days. The patient during this entire period took the diet and potassium salts regularly, the salts including potassium nitrate, chloride and bicarbonate. There were no complaints and no definite toxic symptoms. These large doses of potassium salts failed to establish satisfactory diuresis but produced a condition favorable for the accumulation of potassium in the body. However, the rise of potassium in the serum was very small, 26 mg. per hundred cubic centimeters (6.6 milliequivalents), on the thirty-ninth day, and 24 mg. (6.2 milliequivalents), on the sixty-eighth day.

Even the aforementioned large doses of potassium by mouth are often exceeded by normal individuals whose diet includes large quantities of food rich in potassium. Bunge [27] stated that certain Irish laborers eating chiefly potatoes and certain African tribes living on native foods may ingest as much as 50 Gm. of potassium daily without toxic symptoms. The daily ration of our hospital diets contains from 3 to 5 Gm. of potassium. The comparative safety with which one can administer food containing potassium and potassium salts by mouth is probably due to several factors, the most important being the rate of absorption from the intestine into the portal system, the dilution or detoxification of the salts in the blood stream or during their passage through the liver, and their rapid excretion by the kidney.

Magnus-Levy,[4] Blum [3] and Smellie [28] reported toxic effects in a few patients with cardiac decompensation and edema but no fatalities. Estimations of potassium in serum or urine were not made. We have found it difficult in the written descriptions of these few cases to eliminate entirely the possibility of independent accidents, such as coronary occlusion and acute myocardial failure, so that it is not possible to ascribe the symptoms definitely to potassium intoxication. Pilcher, Calhoun, Cullen and Harrison [29] have also shown that the potassium content of skeletal muscle is decreased in congestive heart failure and have administered potassium dibasic phosphate (up to 14 Gm. daily) in such cases. In order to avoid any toxic effects, Blum [3] and Magnus-Levy [4] advise giving small, initial trial doses in this type of cardiac case, and this is undoubtedly a wise procedure. Up to the present we have never given potassium salts to a patient with extreme oliguria or anuria, or to one whose blood urea was greater than 100 mg. per hundred cubic centimeters. In case 6 (subject B.) a urea content of 100 mg. per hundred cubic centimeters did not prevent satisfactory diuretic action. Small initial doses, advocated in cardiac cases, would also seem to be indicated in cases of dropsy with severe renal insufficiency. Bolliger and Breh [30] demonstrated that in experimental chronic renal insufficiency in the dog the potassium concentration of the blood serum invariably rises. On the other hand, Rabinowitch [26] found a remarkable variation in the concentration of potassium in the serum of patients in severe uremia. In one such case the concentration rose to 72 mg. per hundred cubic centimeters (18.5 milliequivalents), but in several other cases with just as severe retention of urea and creatinine in the blood the values were normal. The distribution of potassium in the tissues of uremic patients would therefore appear to be regulated by factors other than simply a reduced permeability of the kidneys for potassium.

In the experiments of Amberg and Helmholz just mentioned, a preliminary injection of sodium chloride made it necessary to increase the lethal dose of a potassium salt. Osman,[6] in giving large amounts of alkalis to patients with edema, combined potassium and sodium salts in order to protect the patient against the possible toxic effects of potassium. These facts bring up the question as to whether the actual amount of sodium in the body is a determining factor in potassium poisoning. In adrenal insufficiency the amount of sodium is reduced both in the blood serum and in the tissues, while there is often an increase in the concentration of potassium in the serum. Potassium poisoning, therefore, has been suggested as a cause of the serious symptoms. No such toxic symptoms or relationship have been observed in the present study. The concentration of sodium in the serum varied from 285 to 374 mg. per hundred cubic centimeters without any demonstrable relation to the potassium content. Rabinowitch's observations on uremic blood did not show any definite relationship between the sodium and the potassium content. Further experimental work in actual potassium toxemia is necessary to determine the relative significance of the potassium, the sodium and possibly the calcium content of the blood serum.

In any discussion of toxicity of potassium salts the action of the specific anion must be considered. One of us [31] has described the possible toxic effects of the nitrate radical and how these can usually be prevented. The chloride ion has a stronger tendency than the nitrate ion to cause a shift in the acid-base equilibrium to the acid side. Undoubtedly the acid producing salts ammonium chloride and ammonium nitrate have produced an acidosis, with further reduction of renal function in certain types of renal disease.[32] Potassium, bicarbonate, acetate and citrate cause an increased renal excretion of carbonate with a decided shift of the urinary p_H to the alkaline side, and we have not seen any definite harmful action from these effects. This observation agrees with previous clinical experience that potassium bicarbonate, citrate and acetate can be given safely in comparatively large doses.

COMMENT

These biochemical studies indicate that potassium is readily absorbed from the intestine, disappears quickly into the tissues, and can be rapidly excreted by the kidney. The small amount in the blood serum, even after ingestion of a considerable quantity, raises the question as to its manner of storage and subsequent liberation for excretion. The two chief storehouses of potassium are the erythrocytes of the blood stream and the cells of voluntary muscle. In health, any excess

27. Bunge, G.: Ueber die Bedeutung des Kochsalzes und das Verhalten der Kalisalze im menschlichen Organismus, Ztschr. f. Biol. **9**: 104, 1873.
28. Smellie, W. G.: Potassium Poisoning in Nephritis, Arch. Int. Med. **16**: 330-339 (Aug.) 1915.
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seems to be quickly removed from the blood serum and is then gradually excreted by the kidneys. Following depletion of potassium due to starvation and that seen in cardiac edema, there is retention with a refilling of the muscle storehouse. Was the potassium retention in case 1 (subject A.) with anemia due to an analogous need for the refilling of the potassium storehouse in the erythrocytes? The efficiency with which the kidney concentrates potassium, at least fifty times, readily explains the rapid elimination of a great excess taken in the diet by eaters of potatoes, for example. The sustained high concentration in the urine in case 2 (subject G.), in which there was a definite renal lesion, suggests that the ability of the kidney to excrete potassium may be maintained late in chronic nephritis in a similar way to its ability to eliminate creatinine. The much greater concentration by the kidneys of potassium than sodium may possibly be explained by less reabsorption of the former in the renal tubules.

Bunge [27] suggested that potassium and sodium may replace each other in the animal organism. The experimental evidence he gave was that the ingestion of potassium salts resulted in a definitely increased excretion of sodium in the urine. Our data reveal an increased excretion of sodium by some of our normal individuals and in case 1 (subject A.); in the normal individual M. and in cases 2 and 4 (subjects G. and Pe. respectively), however, the increase was insignificant. These results together with those of Miller [33] again emphasize the well known fact that potassium and sodium have certain independent biologic functions, as, for instance, the high concentration of sodium in blood serum and interstitial fluid in contrast to the small content of potassium, the high concentration of potassium in the erythrocytes with little or no sodium present, and also the initial retention of water with the ingestion of sodium salts in contrast to loss of water after taking potassium salts.

In the present study five potassium salts have been shown to cause diuresis. The cation potassium is readily excreted in each instance by the kidney; it also brings about a definite shift of the acid-base equilibrium in the urine toward the alkaline side. These two facts offer a possible explanation for its diuretic action. It should be pointed out, however, that of the five salts the nitrate produced the most marked effect, which emphasizes the importance of the anion as well as the cation in considering the diuretic action of a given salt.

Our clinical results with potassium salts have been encouraging. They confirm the results of the therapeutists of the last eighty years.[35] We prefer potassium nitrate because, after its use, diuresis frequently occurs. In our experience it is less likely to cause toxic symptoms than ammonium nitrate. Its action, when combined with other diuretics, is also often satisfactory. Diuresis from potassium nitrate may be initiated more slowly and be of longer duration than that of other diuretics, but it is less likely to cause untoward effects. Organic compounds of mercury act more rapidly but in so doing may injure tissues, such as those of a diseased kidney. Potassium salts, more particularly the bicarbonate, acetate and citrate, produce a rapid shift in the acid-base balance, rendering the plasma and urine more alkaline. This action suggests that these potassium salts may be more effective and less likely to cause edema in combating acidosis than sodium salts. They might also be used when a strongly alkaline urine is desired.

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ABSTRACT OF DISCUSSION

Dr. Herbert Barker, Chicago: Drs. Keith and Binger's paper brings out two points that are of special interest to me: that the potassium salts may be used in a variety of conditions for their diuretic effect and that they may be used in those conditions without fear of toxicity. Their report should aid in dispelling fears in connection with the administration of potassium to patients with renal disease. Five years' use of potassium chloride has not given any untoward effects except in possibly three instances. All three patients were suffering from advanced glomerular nephritis with edema, hypertension and nitrogen retention, so that there were many factors entering into the symptomatology. The symptoms in question were those of weakness and increased feeble heart action with a gallop rhythm. The blood potassiums at that time were 35, 35 and 40 mg. per hundred cubic centimeters. These are the highest blood potassium readings I have obtained with doses ranging from 3 to 10 Gm. daily. Doses as great as 60 Gm. daily have been reported in the literature and the only untoward effects recorded are nausea, vomiting and diarrhea. I have had no experience with potassium nitrate. Chemically it should be effective when the acid-base equilibrium is not greatly disturbed. My experience with potassium chloride has been largely confined to the chronic cardiac edemas of valvular and hypertensive vascular types. In these cases the reduction of chlorides in the body due to long standing salt restriction renders a diuresis very poor with diuretics, especially the mercurials. It is therefore especially important to administer chlorides, as the potassium or ammonium salts, until blood chlorides are raised to 500 mg. or more per hundred cubic centimeters. I feel, therefore, that the mineral control of fluid balance, though relatively simple to operate, is often much more effective when blood chemical determinations are used to assist in choosing the proper salt for administration, and it is equally important as a guide to probable desirable changes from one salt to another as the course of the disorder progresses.

Dr. Carl H. Greene, New York: A great deal of credit is due to the men who pointed out the relationship between water retention and salt metabolism in the body and demonstrated the clinical application of these facts in the management of cases of renal disease. When ammonium chloride and calcium chloride were first introduced it was believed that diuresis was due to the acidifying action of the chloride ion. When ammonium nitrate was introduced it was suggested that the nitrate ion perhaps had a specific diuretic action of its own. The diuretic action of potassium chloride, on the other hand, has been explained in part at least as the displacement of sodium salts in the body by potassium salts. I hope that the authors will tell us a little more with regard to their conclusions as to the relative importance of these various effects in determining the diuretic action of potassium nitrate. The administration of ammonium salts must be carried out with care to avoid unpleasant gastro-intestinal symptoms. How do the authors administer potassium nitrate and in what medium or vehicle? Do they consider that there are specific indications which would lead them to use potassium nitrate in a case instead of the other acid salts with which the profession is more familiar?

Dr. Melvin W. Binger, Rochester, Minn.: Dr. Greene has asked a difficult question regarding the point of action of potassium salts. I feel that there is certain displacement of sodium in the blood and in the tissues by potassium, but I do not feel that this is the total action of potassium as a diuretic. The red blood cells contain a larger percentage of potassium than the plasma. The plasma contains more sodium, and it is not known whether there is a shift in this balance in the administration of potassium salts. I rather feel that there is some shift in electrolytic ionization, although there may be a direct action on the kidney itself. Regarding the administration of potassium nitrate, we are using enteric-coated pills of 0.5 Gm., and we

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give from sixteen to twenty-four of these daily. Potassium nitrate can be given in a 12 per cent solution, two tablespoonfuls three or four times a day, but it does upset the stomach and, if given on an empty stomach in a 12 or 25 per cent solution, it will cause irritation. In fact, the morning that I took 12.5 Gm. (25 per cent solution) I developed severe abdominal cramps, which lasted about half an hour. Of course, it was on an empty stomach and double the concentration that is usually given. We advise patients to take potassium nitrate after their meals. They are put on a salt-free, low-fluid (from 800 to 1,000 cc.) diet and usually 50 Gm. of protein daily unless the serum protein is low, as in the nephrosis type of case. In such cases the protein intake is increased to 75 or 100 Gm. daily.

PRIMARY ESOPHAGEAL CARCINOMA, WITH ESPECIAL REFERENCE TO A NONSTENOSING VARIETY

A CLINICOPATHOLOGIC STUDY BASED ON ONE HUNDRED AND EIGHT NECROPSIES

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AND
TRUMAN G. SCHNABEL, M.D.
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Recently, within a comparatively short period, autopsies revealed esophageal carcinoma in four patients who had not presented dysphagia, pain, regurgitation of food and vomiting, the characteristic symptoms. In the absence of the usual clinical picture presented by the disease, their physicians had not appreciated the presence of a new growth in the esophagus; they found some consolation for their failure in diagnosis, however, in the fact that the postmortem examination presented carcinomatous lesions which were nonstenosing and therefore did not obstruct the passage of food.

The evidence in these four cases prompted the undertaking of a clinicopathologic analysis of the Philadelphia General Hospital series of patients from 1920 to 1933. It was hoped that such a study might point the way to certain conclusions concerning the incidence of nonobstructive carcinomatous lesions in the esophagus, that distinguishing clinical evidences might be brought to light, that the relative degree of clinical and pathologic malignancy of stenosing and nonstenosing tumors might be illuminated, and that perhaps other important changes concerning both the obstructive and the nonobstructive variety might be revealed.

MATERIAL

During the thirteen year period approximately 260,000 patients were admitted to this institution. Of this number, 247 had carcinoma of the esophagus, making an admission rate of slightly less than 0.1 per cent. Two hundred and twenty-six of this group died in the hospital and the remainder died after being discharged. One hundred and eight came to autopsy; of this number twenty-two, or 20.3 per cent, exhibited a nonstenosing variety of lesion, and in eighty-six the lesion was certainly obstructive. The results of the clinicopathologic study of these autopsies are presented herewith.

SEX

The general admission records of this hospital show that 56 per cent are females. The general autopsy record shows that 40 per cent are females. In this especial group of 247 patients presenting esophageal carcinoma, including both the 108 cases that came to autopsy and the 139 cases in which an autopsy was not done, 7.3 per cent were women. Among the number with obstructive tumors 5.8 per cent were women, and among the number with the nonobstructive variety of the disease 13.6 per cent were women.

AGE AND RACE

A majority of the patients were between 50 and 70 years of age. Among those with stenosing carcinoma 67 per cent were within this age range, and among those with the nonstenosing form 68 per cent were within the same range. In the first group the youngest patient was 42 and the oldest 85, while in the latter group the youngest was 35 and the oldest was 91.

There were eighty-four white (77.7 per cent), twenty-two Negro (20.3 per cent), and two Chinese (1.9 per cent) patients in the autopsy series of 108. Both the admission and the autopsy records show that 33.3 per cent were Negroes. In the entire series of 247, the percentage of Negroes was 11.5.

HISTORICAL DATA

The historical data obtained from these patients were much alike as to both the obstructive and the nonobstructive type. In the combined group the history of five patients showed familial cancer, and in the history of two patients there was a vague suggestion of it. The father of one patient had died of carcinoma of the esophagus. The histories as to previous illnesses, occupations and habits of life were so varied that they did not warrant definite conclusions. The fact that the group history was singularly free from evidence of alcoholism may be the more in point because the patients represented, generally speaking, a low economic and cultural level. It has been suggested, indeed, that hardship may be a predisposing factor in the development of cancer of the esophagus. Five of the autopsy group had positive Wassermann reactions and a few had pulmonary tuberculosis.

TABLE 1.—*Incidence*

Sex	Stenosing	Nonstenosing
Males	81	19
Females	5	3

TABLE 2.—*Metastases*

	Stenosing	Nonstenosing
Number of cases	86	22
Regional nodes	59	21
Abdominal nodes	34	10
Lungs	16	4
Liver	21	9

PATHOLOGIC CHANGES

The three gross anatomic types of esophageal carcinoma found at postmortem examination were:

First, a large fungating carcinoma which protruded into the lumen, producing obstruction with dilatation proximal to the new growth. This type was responsible for the well known clinical syndrome of obstruction.

Second, an annular type, often partially or completely surrounding the lumen of the esophagus, extending out-

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Read before the Section on Gastro-Enterology and Proctology at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 14, 1935.

ward and adhering to adjacent structures but not encroaching on the lumen. This type was ordinarily nonstenosing but produced dysphagia in some instances by reason of the esophagus being anchored (as often occurs in this type) at an unusual point or points. The mucosa often appeared grossly to be intact.

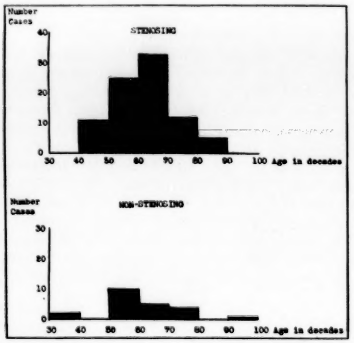

Chart 1.—Age incidence in stenosing and nonstenosing tumors.

Third, the ulcerating type, with no narrowing of the lumen, usually with dilatation of the esophagus. This variety was always nonstenosing.

Fifty-one per cent of the new growths were located in the middle third of the esophagus. In this autopsy series there were no nonstenosing lesions found in the upper third. Eighty per cent of the stenotic tumors were found in the lower two thirds, while all the nonstenosing variety were discovered there.

Histologic study showed all the tumors to be of either squamous or undifferentiated types of carcinoma. Some patients in the records were diagnosed as having cancer of the esophagus, but further study of the stained sections and the description of gross lesions

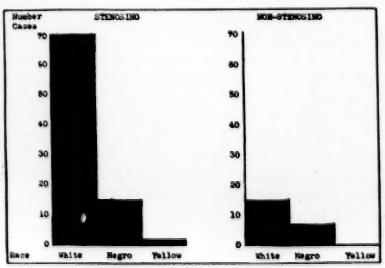

Chart 2.—Race incidence in stenosing and nonstenosing tumors.

showed very clearly that they were examples of adenocarcinoma involving the cardia and represented secondary extension to the esophagus from primary cancer of the stomach. Such patients have not been included in this study, contrary to the habit of some writers who have presented analytic reports on carcinoma of the esophagus, based at times on tissue secured through the esophagoscope for biopsy. Of the patients on original record, diagnosed grossly and microscopically as having primary cancer of the esophagus, ten slides were not available to this analysis for graded study.

According to Broders' classification, approximately 52.5 per cent of the stenosing and nonstenosing tumors revealed grade 2 carcinoma structure, 40.7 per cent of the stenosing group were grades 3 and 4, while 47 per cent of the nonstenosing group showed cells of the same grades.

The average prehospital duration of symptoms for the patients of the stenosing type was 193 days. The average of their hospital stay was forty-one days. For the nonstenosing type, the average symptom time was seventy-five days and the average hospital stay thirteen days. One patient with nonobstructing carcinoma had had symptoms for two years, while another had complained for only two days before admission to the hospital.

Chart 5 shows that the patients having grade 2 stenosing tumors complained of their symptoms on an average of 225 days before death. The shortest period of illness, 180 days, occurred in the grade 3 class of stenosing tumors. This apparently indicates an approximate difference of only a month and a half. Undifferentiated nonstenosing grades of tumors were characterized by an average duration of symptoms of

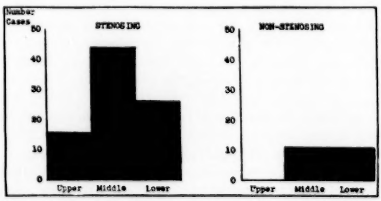

Chart 3.—Location of pain in cases of stenosing and nonstenosing tumors.

116 days and grade 3 by a duration of about seventy-five days, showing also an approximate difference of a month and a half.

Table 2 indicates the sites to which the primary esophageal lesion most frequently metastasized. The location and degree of metastasis did not seem to vary perceptibly as between the stenosing and nonstenosing types. Occasional metastases were found in the stomach, pancreas, kidneys, adrenals, diaphragm, pleurae, pericardium, spleen, thyroid, trachea and aorta. From the histopathologic point of view, all the various types of carcinoma showed a tendency toward infiltration, permeation and/or metastasis, and no relation was noted between the grade found and the degree of extension.

CLINICAL FEATURES

Dysphagia was the earliest and most frequent complaint among the eighty-six patients with stenosing tumors. It was recorded in 94 per cent of such cases. In the nonobstructive group of twenty-two, three complained of dysphagia. In one of these three the esophagus was found to be adherent to the aorta. In another a mediastinal abscess was found. In the third there was an extensive permeation of the posterior mediastinum. Weight loss ranging from a few to a hundred pounds or more occurred in about 75 per cent of the patients, in both the obstructive and the nonobstructive

group. While pain was complained of in both groups, it was noted in 60 per cent of the nonstenosing tumors as against only 39 per cent of the stenosing. The pain varied greatly in character and location; sometimes it was complained of in more than one region. It might be by turns dull, sharp, boring or burning; in some

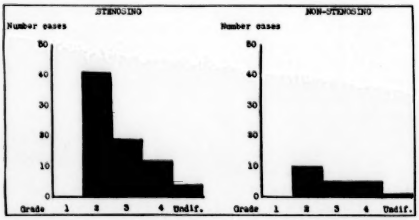

Chart 4.—Cell grade (Broders) of stenosing and nonstenosing tumors. Undif. indicates undifferentiated grade consisting of small, round cells impossible to classify except as carcinoma.

cases it was present only during swallowing; in other cases it was continuous. While it occurred more frequently in the epigastrium, it was also related to various parts of the chest, chiefly retrosternal, lateral, interscapular and middorsal, and in a few instances it was complained of in the shoulder and down the arm. In 61 per cent of the cases of stenosing and 40 per cent of nonstenosing tumors there was no pain. Vomiting occurred in both types of patients at the time of admission to the hospital—in 14 per cent of the cases

TABLE 3.—*Symptoms*

	Stenosing	Nonstenosing
Number of cases	86	22
Dysphagia	81	3
Loss of weight	64	17
Pain	33	13
Chest	11	6
Epigastrium	20	6
Back	5	3
Retrosternal	4	1
No pain	53	9
Vomiting	12	6
Regurgitation	7	0
Cough	13	8
Hoarseness	6	3
Weakness	22	3
Hematemesis	0	1
Tarry stool	0	1

with obstruction and in 27 per cent without obstruction. It transpired, however, following a close review of the case histories, that the rather surprisingly low percentage of the instances of vomiting in the cases showing obstruction could be accounted for, in part at least, by the fact that patients with obstructive lesions had gradually learned so to regulate the type and the amount of food taken as to avoid regurgitation and vomiting. They progressed from solids to semisolids and finally to small quantities of liquid only. They also limited their intake because of a loss of appetite and because of the development of pain in swallowing. Food was not regurgitated in any cases in which there was no stenosis. Cough was present in 15 per cent of the stenosing type and in 36 per cent of the nonstenosing. Hoarseness was apparent in 7 per cent of the stenosing and in 13 per cent of the nonstenosing type.

It can be said for the group as a whole that the blood picture, including both blood counts and chemical analyses, was highly variable, permitting no significant deductions and indicating no consistent trend. There were of course some unusual manifestations in the blood studies, some of which may have been attributable to dehydration and to starvation. Gross hemorrhage was conspicuous by its absence; hematemesis occurred in only one case, and tarry stool was observed in only one other.

DIAGNOSES

Correct diagnoses were made in 92 per cent of the eighty-one cases of stenosis. For the other seven patients the diagnoses recorded were mediastinal tumor,

TABLE 4.—*Diagnoses of Clinical Record in Twenty-Two Cases of Nonstenosing Tumors*

	Cases
Carcinoma of esophagus	2
Pulmonary tuberculosis	6
Tuberculosis with empyema	1
Lung abscess	1
Bronchopneumonia	1
Carcinoma of stomach	1
Carcinoma of lungs and liver (metastatic)	1
Carcinoma of liver	1
Cirrhosis of liver	1
Aneurysm of abdominal aorta	1
Aneurysm of thoracic aorta	2
Chronic alcoholism	1
Cardiovasculorenal disease (senile dementia)	2

esophageal obstruction (not specified), carcinoma of the liver, carcinoma of the stomach (two cases), acute nephritis and pulmonary tuberculosis. These errors in diagnosis were made in the case of persons who were not dysphagic and who were not studied roentgenographically with reference to the swallowing function. The clinical impression for carcinoma was supported by characteristic roentgen changes in the greater number of stenosed patients. Examination of biopsies in turn corroborated both the clinical and the roentgenologic opinion in respect to twenty-one patients. In two other cases esophagoscopy was done, and the tissues obtained were reported as being of the chronic inflammatory type. The tissues removed at autopsy, however, showed carcinoma.

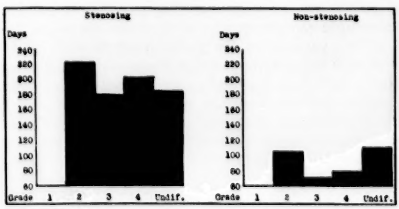

Chart 5.—Average duration of symptoms according to cell grade in stenosing and nonstenosing tumors.

The errors of diagnosis in table 4 are all explicable in the absence of dysphagia. For instance, an emaciated patient with some febrile reaction and with equivocal signs in the chest might easily, in the absence of another explanation, suggest pulmonary tuberculosis. And equally plausible reasoning might be applicable to others of these erroneously diagnosed cases. One of the two correct diagnoses was reached because the patient evi-

denced a certain difficulty in swallowing during the last days of his illness. The other correct diagnosis was arrived at by roentgen study. This patient was one of four of the nonstenosing group for whom a complete roentgenologic study of the gastro-intestinal tract was made. Reports on three of these patients were negative for carcinoma of the esophagus. The fourth for whom the correct diagnosis was made had an annular type of lesion, adherent to the trachea, and registered delay in the time of transit of the barium sulphate meal.

GASTROSTOMY

Thirty-five patients had had gastrostomies performed at some time before death. The average length of life after hospitalization of the patients who were operated on was sixty-eight days, as compared with eighteen days for those not operated on. A majority of the patients who were operated on lived less than thirty days, and the greatest length of life after operation was 450 days.

The part that bronchopneumonia plays in the termination of life for these patients is noteworthy. Sixty-seven per cent of the stenosed patients died from this immediate cause. In some of these cases the pneumonia clearly developed from the aspiration of food.

SUMMARY AND COMMENT

A review of the data as presented makes it quite clear that the generally recognized description of carcinoma of the esophagus applies, in the main, to both types. These studies corroborate the prevailing impression that men are more frequently afflicted than women, in a variable ratio. No evidence to account for this has been brought to light by this or by other studies. The age of the patients in the group studied here corresponds with the generally observed cancer-bearing years of life. As to race incidence, although our figures seem to suggest that the Negro is less likely than the white person to develop carcinoma of the esophagus, this study does not seem to furnish sufficient evidence for a conclusion in this regard. Nor can any decisive point be made concerning heredity, previous illnesses and habits of life as affecting the development of carcinoma of the esophagus.

TABLE 5.—*Causes of Death*

	Stenosing	Nonstenosing
Number of patients	86	22
Carcinoma (uncomplicated)	18	10
Bronchopneumonia	58	9
Pulmonary tuberculosis	5	0
Postgastrostomy peritonitis	2	0
Suppurative mediastinitis with bronchopneumonia	0	1
Infiltration of aorta, rupture, fatal hemorrhage	0	1
Suppurative mediastinitis	0	1
Mediastinal abscess	1	0
Empyema	1	0
Postesophagectomy hemorrhage	1	0

The gross pathologic lesions observed in the group described are those generally recognized and the positions of these lesions are the positions heretofore generally noted. It is worth remarking, for further study or demonstration, that this particular study revealed not a single instance of a nonstenosing lesion in the upper third of the esophagus.

From the histopathologic aspect, if the Broders method of classification is also a measure of malignancy, it would seem that the cancer of cases reviewed here was of only moderate malignancy and that it was apparently of the same degree in the stenosing and nonstenosing varieties. It would also appear to follow that the grade of squamous cell carcinoma does not determine the stenosing and nonstenosing possibilities of a carcinomatous lesion in the esophagus. Grossly ulcerative lesions showed all grades of malignancy.

From the clinical point of view, these studies confirm the generally accepted belief that carcinoma of the esophagus is a rapidly malignant disease. This would seem to apply particularly to the nonobstructed patients, whose brief course of illness was only approximately a third of the course of illness of the patients in the obstructed group. In this regard, however, some account should be taken of the fact that patients obviously found difficulty in establishing definitely the exact time of onset of symptoms.

On the whole, our analysis (chart 5) would seem to indicate no significant relationship between the grade of carcinoma and the duration of symptoms. This may mean that grading does not actually measure the degree of malignancy or it may mean that the duration of apparent symptoms in this disease is no real measure of the degree of malignancy. It is quite possible that a lesion in the esophagus, occupying as it does a relatively cryptic position, may in the case of the better differentiated tumor actually exist for a longer time than the symptoms seem to indicate. This is a reasonable inference if one judges by the life history of similarly graded tumors growing in easily observed locations, such as the skin and the cervix uteri. It seems reasonable to believe, on the basis of the studies here reviewed, that the clinical picture of esophageal carcinoma takes its character largely from the presence or absence of stenosis and is not dependent on the relative differentiation of the neoplastic squamous cell found under the microscope.

The outstanding implication is that the usual description of esophageal carcinoma has not sufficiently taken into account the nonstenosing variety, which very obviously cannot be responsible for difficulty in swallowing. In our patients with nonstenosing lesions the striking symptoms were loss of weight, pains in or about the chest, vomiting, cough and hoarseness. The loss of weight is apparently due to some subtle effect of carcinoma other than that resulting from a decreased caloric intake. In both the stenosing and the nonstenosing variety there would seem to be no direct relationship between the location of the carcinoma and the site of the pain.

It is probable that both varieties of lesions are fairly well advanced before symptoms become evident. Very early diagnosis is therefore rather a remote possibility unless a thorough investigation of the esophagus is made part of a periodic or otherwise routine examination, or unless the diagnostician has a lively and consistent recognition of the possibility that a patient with no difficulties in swallowing, with emaciation, perhaps with vomiting, with pain in the chest, cough and hoarseness, otherwise unexplained, may present this picture because he has carcinoma of the esophagus.

It may be pointed out that gastrostomy afforded in the cases reviewed very little extension of life beyond that of the patients who were not operated on. The failure of therapy thus far, together with the fatal outlook for this disease, should not discourage attempts at very early diagnosis; these sinister factors should, on the contrary, emphasize the need for calling into play at an early stage every diagnostic resource.

CONCLUSIONS

1. Of the esophageal carcinomas in a series of 108 cases that came to autopsy, 20.3 per cent were of the nonstenosing type.

2. Patients in this series with nonstenosing esophageal carcinoma presented weight loss, pains in the chest, vomiting, cough, hoarseness and weakness as outstanding symptoms. Dysphagia was distinguished by its relative infrequency, whereas in the stenosing group it was the dominant symptom.

3. The sex, age and race incidence, the location of pain, the metastases, and the immediate causes of death were much alike in patients with stenosing and nonstenosing lesions.

4. While clinically both the stenosing and the nonstenosing lesions were rapidly malignant, the clinical course in the nonstenosing group was only one third as long as that of the stenosing.

5. Pathologically, these tumors were not particularly malignant, and there was no correlation between the grade of the tumor, the clinical course and the stenosing or nonstenosing tendencies.

6. Whether roentgen investigation is positive or negative for this disease, the suspected patient should be subsequently studied by esophagoscopy, and, at the same time, properly selected tissue should be procured for histologic study. A single or even a subsequent report of failure to find tumor, however, should not be considered as finally precluding a diagnosis of carcinoma.

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ABSTRACT OF DISCUSSION

DR. GABRIEL TUCKER, Philadelphia: The evidence presented is incontrovertible because it is obtained by necropsy. I should like to ask the authors whether postmortem examination showed gross evidence of stenoses in any case in which there had been no complaint of dysphagia. Clinically I have seen patients without any complaint of dysphagia when a routine roentgen study of the neck, chest and swallowing function showed the lodgment of a large capsule in the lower third of the esophagus. On esophagoscopic examination a nonstenosing lesion was found and biopsy showed carcinoma. The inspection of the lesion through the esophagoscope gives a characteristic appearance. One may see at times that the location of the lesion makes it inadvisable to do a biopsy. A negative biopsy should not be considered conclusive. The second, third or fourth biopsy may show cancer. The symptom of hoarseness is usually due either to involvement of the laryngeal nerve or, in the stenosing type of cancer, to overflow of secretion from the pharynx, producing inflammatory changes in the larynx. In hoarseness, cancer of the esophagus is to be excluded as a possible etiologic factor. Esophagoscopy is a major diagnostic procedure and should be done with every possible precaution to avoid injury. The conclusions drawn by the authors from their studies should lead to earlier and more thorough examination of every patient for evidence of esophageal disease. Cancer of the esophagus should be recognized earlier. The advancement of the technic of irradiation and surgery of the esophagus leads to the hope that the authors have advanced one step nearer to finding a cure for cancer of the esophagus. A woman, 39 years of age, had marked obstructive symptoms in the esophagus. Roentgen examination showed a large dilatation of the esophagus with the typical picture of achalasia (so-called cardiospasm) with a stenosis at the level of the diaphragm. There was retention of a great deal of food in the esophagus and, after lavage of the esophagus and thorough cleansing, esophagoscopy was done and revealed a fungating, ulcerating lesion on the left anterolateral wall about 5 inches above the level of the diaphragm. The esophagus at this level was so dilated that the fungating lesion did not come in contact with the wall of the esophagus except at the point of its attachment and, although of considerable size, was not obstructing the lumen of the esophagus. A biopsy showed the lesion to be cancer. At the time of the examination, the esophagoscope was passed into the stomach through the stenosed area at the level of the diaphragm and the typical picture of achalasia was found, there being no lesion discernible. This case illustrates a nonstenosing type of cancer with esophageal stenosis due to achalasia, in which the esophagoscope was the only means by which a positive diagnosis could be made. However, after the esophagus had been thoroughly cleansed the roentgen examination showed an irregularity in the anterior wall, with dilatation of the esophagus at the level of the cancerous lesion.

DR. TRUMAN G. SCHNABEL, Philadelphia: We were surprised after we had analyzed this group of autopsies to find that nonstenotic carcinoma of the esophagus had been present in 20.3 per cent. We had anticipated a short average clinical course for the 108 patients, seven and a half months, but were particularly surprised that those of this series with nonstenotic lesions had lived only a little less than an average of three months after the onset of their symptoms. It was also surprising not to have found a correlation between the grade of the tumor, according to the Broder classification, the length of the clinical course and the presence of a stenosing or a nonstenosing lesion. Tissue obtained by way of the esophagoscope may not show the malignant nature of esophageal lesions, particularly if dependence is placed on a single specimen. Esophagoscopy becomes more important when it demonstrates that esophageal dysfunction as exhibited by roentgen study is not due to an intrinsic lesion in the esophagus. I know of a patient who had a number of roentgen treatments, following what seemed to be positive roentgen evidence for carcinoma. Autopsy after sudden death demonstrated mitral stenosis with a large left auricle pressing on the esophagus. Here better roentgen studies and esophagoscopy would have established the correct diagnosis and therefore the futility of the treatment. After we had completed this analysis we saw a patient who had lost weight and who had unusually palpable cervical glands, some inequality of the pupils and hoarseness. With nonstenosing esophageal carcinoma fresh in our minds, we ordered roentgen investigation of the esophagus, even though there were no suggestive symptoms pointing to an esophageal lesion. The evidence from this source showed, what was borne out by subsequent biopsy investigation, that we were dealing with carcinoma of the esophagus. A year ago the patient would have remained a diagnostic puzzle. The results of these studies should serve to remind one that carcinoma of the esophagus may not cause dysphagia. I should like to point out in answer to Dr. Tucker's question that five patients of this group with obstructing lesions did not complain of difficulty in swallowing. Long before patients present dysphagia as a symptom, and even if they never refer to pain or difficulty in swallowing, one should be conscious of carcinoma of the esophagus. Early roentgen investigation and esophagoscopy should be practiced to establish the presence or absence of this malady.

Too Many Mothers Make the Mistake.—The period of menstruation is commonly referred to as the period of being "unwell," and this is a rather unfortunate concept of the function. It is a perfectly normal phase and this is the idea of it which should be impressed upon young girls. Too many mothers make the mistake of impressing their daughters with the importance of coddling themselves during the periods, of abstaining from play and exercise at this time and, in short, of actually considering themselves sick. As a consequence, because of the power of mind over body, many girls do actually become sick and develop into menstrual invalids of one sort or another, as I shall have occasion to discuss later. This is particularly true if the mother, or perhaps an older sister, herself suffers with menstrual disorders of one sort or another, for the impressionable child, just beginning to menstruate, soon comes to look forward to each period as one when she must expect to suffer incapacity of one degree or another.—Novak, Emil: The Woman Asks the Doctor, Baltimore, Williams and Wilkins Company, 1935.

Clinical Notes, Suggestions and New Instruments

A NEW METHOD OF REMOVAL OF FOREIGN BODIES FROM STOMACH WITH THE AUTHOR'S SHEATHED FLEXIBLE GASTROSCOPIC FORCEPS

GABRIEL TUCKER, M.D., PHILADELPHIA

About a year ago I suggested and published a method of localization of foreign bodies in the stomach by means of roentgen examination by fluoroscopy and films following the introduction of an opaque feeding tube through the esophagus and the inflation of air into the stomach. This method has proved quite successful, and while using it it occurred to me that, if a flexible forceps should be devised that might be introduced into the stomach in the same manner as the feeding tube had been introduced for localization purposes, the removal of foreign bodies from the stomach could be carried out, and that, if this method should prove successful and a safe technic be developed, it would be very much simpler than the method of open tube gastroscopy now in use.

In foreign body removal the open tube gastroscope under double plane fluoroscopic guidance is generally used. In many cases great difficulty is encountered because the foreign body falls back alongside the spine in the left half of the stomach or on the right side of the spine in the pyloric end, where it is difficult to grasp through the gastroscope when the patient is placed in the usual dorsal recumbency for gastroscopic removal. Fluoroscopic guidance is always a necessity in the open tube method of gastroscopic removal of foreign bodies from the stomach. With the use of a sheathed flexible forceps, dispensing with a rigid open tube gastroscope, the patient can be placed in the upright or semiupright position after the forceps is in position and gravity carries the foreign body to the greater curvature of the stomach, where it is easily accessible. In the case of a child in dorsal recumbency, the patient can be rotated on the table until gravity and inflation of the stomach allow the foreign body to be grasped by the use of the sheathed flexible forceps under fluoroscopic guidance.

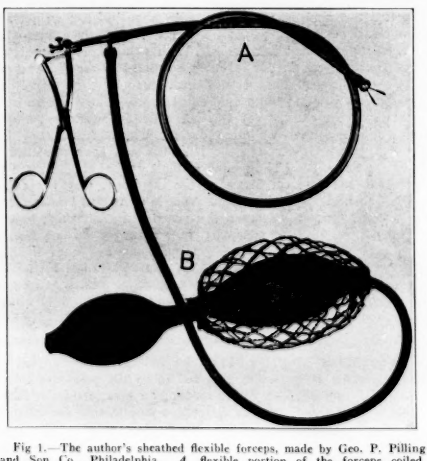

Fig 1.—The author's sheathed flexible forceps, made by Geo. P. Pilling and Son Co., Philadelphia. *A*, flexible portion of the forceps coiled, showing the degree of flexibility that will be permitted by the forceps. The blades are in the open position for grasping. *B*, the double bulb arrangement for inflation, either for diagnostic examination or for assistance in grasping and removing a foreign body. Inflation may be carried out with the forceps blades either sheathed or unsheathed.

The sheathed flexible forceps (fig. 1) that I[1] devised is of the cannula and stylet type with a modified handle and has a very strong and secure grasp. The flexible forceps is covered with a rubber tube sheath or jacket, the size of which is No. 18 French in the child size instrument and No. 20 French in the adult size. The sheath has attached to it a metal ball at the lower end, which is perforated for the passage of the forceps blades; at the upper end of the jacket is a slotted metal sleeve attachment that permits the adjustment of the jacket so that the forceps blades will be covered for introduction. After the forceps is introduced and fluoroscopic guidance indicates that it is in contact with the foreign body, the rubber tube jacket is drawn up about 1 cm. and secured by the handle mechanism, allowing the forceps to protrude beyond the metal ball at the end of the jacket so that the foreign body can be grasped. The metal sleeve at the upper end of the rubber sheath is provided with an attachment that permits the introduction of air by means of a double bulb, so that the stomach can be inflated, thus releasing the foreign body from the folds of the stomach. The metal ball on the lower end of the rubber jacket guides the forceps around the greater curvature and prevents trauma during the introduction.

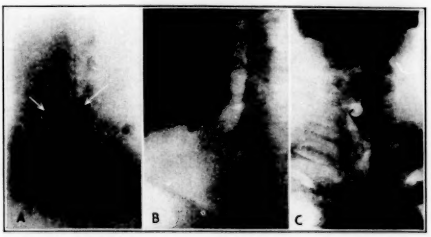

Fig. 2.—*A*, tooth plate in the stomach. *B*, sheathed flexible forceps grasping the artificial denture, which has been withdrawn upward into the lower end of the esophagus. *C*, denture in the upper end of the esophagus. The grasp of the forceps covers the projecting point of the gold clasp. The curved clasp opposite was withdrawn through the esophagus without trauma. Roentgenograms by Dr. Karl Kornblum.

TECHNIC OF INTRODUCTION AND USE OF THE SHEATHED FLEXIBLE FORCEPS

In working out a technic for the use of this instrument I had the expert advice and invaluable assistance of Dr. Eugene Pendergrass of the Hospital of the University of Pennsylvania and of Dr. Karl Kornblum of the Graduate Hospital of the University of Pennsylvania. The entire procedure for removal of foreign body and introduction of the flexible forceps should be carried out under biplane fluoroscopic guidance, with the assistance of an expert roentgenologist with whom the endoscopist is accustomed to work. With adults a vertical plane fluoroscope of the motor driven tilt table type may be used. The patient is placed in the semirecumbent or upright position and rotated in front of the fluoroscopic screen giving biplane fluoroscopic guidance. For use in children, biplane fluoroscopic guidance in dorsal recumbency is necessary in order to control the patient. With the flexible forceps introduced into the stomach, however, the patient may be rotated so that gravity will carry the foreign body to a point at which it is accessible to the grasp of the forceps.

Introduction.—In adults the sheathed forceps may be introduced like the ordinary stomach tube under fluoroscopic guidance. Previous roentgen study in all patients should exclude esophageal disease that would contraindicate introduction of the sheathed forceps. In children, when the patient is placed in dorsal recumbency, a child-size direct laryngoscope may be used to lift the cricoid forward so that the tip of the sheathed forceps

Read before the Section on Laryngology, Otology and Rhinology at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 14, 1935.

1. Tucker, Gabriel: A Sheathed Flexible Gastroscopic Forceps, Proceedings of the American Bronchoscopic Society, Toronto meeting.

can be placed in the upper esophagus by sight. It is then gently passed downward and the laryngoscope removed. Further introduction is carried out under fluoroscopic guidance. This technic may be used also in the adult if any difficulty is anticipated. When the sheathed forceps has entered the stomach it is passed farther in until the metal tip comes in contact with the greater curvature of the stomach. If there is a question of the foreign body not being in the stomach, the stomach can be inflated through the sheathed forceps and the location of the foreign body with reference to the cavity of the stomach can be definitely determined by fluoroscopic observation. If the foreign body is in the stomach the patient can be rotated and the forceps manipulated until the metal end of the sheathed forceps is in contact with the foreign body. The sheath is then withdrawn sufficiently to allow grasping of the foreign body. The foreign body may be manipulated and turned until the proper grasp for withdrawal is obtained by inflation of the stomach with air through the forceps and manipulation with the forceps, the patient being rotated if necessary. Withdrawal of the foreign body after it has reached the hiatal esophagus is facilitated by slight inflation through the forceps with a hand bulb. Gentle traction is made and the additional air that has been introduced may produce regurgitation with consequent relaxation of the hiatal esophagus, and the foreign body will slip easily into the lower end of the esophagus while the hiatal sphincter is relaxed. Sufficient time for the hiatal sphincter to relax while gentle traction is made is necessary to avoid trauma. When the foreign body has been brought into the upper end of the esophagus, the laryngoscope may be reintroduced over the sheathed forceps and the cricoid lifted forward. During the introduction and use of the forceps a trained assistant to hold the head and another assistant to maintain the position of the shoulders are necessary in addition to the fluoroscopic aid of an expert roentgenologist.

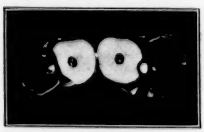

Fig. 3.—Gold denture removed from the stomach with the sheathed flexible forceps.

Caution.—Extreme gentleness should be used and plenty of time allowed for the musculature of the esophagus to relax during all manipulations to prevent trauma. With the use of the sheathed flexible forceps, as in all examinations and treatments of the esophagus, haste and undue force have no place. They will result in disaster. Even the ordinary stomach tube will rupture the esophagus if sufficient force is used in introduction.

REPORT OF CASES

The method has not been in use long enough to establish definite conclusions. However, a number of foreign bodies have been removed without any difficulty and the reports of two cases are submitted:

CASE 1.—A physician, aged 63, dislodged a gold dental bridge containing two teeth while eating his breakfast two weeks before he came to me for removal of the foreign body. Repeated roentgen examination before admission showed the denture in the stomach. It apparently would enter the pyloric end of the stomach and then be regurgitated into the stomach, not passing through the pylorus. I explained to the physician my new forceps and method of removal, and he requested that I remove the foreign body from the stomach by this method. The patient was placed on a fluoroscopic, motor driven, tilt table and the forceps was introduced in the same manner as the ordinary stomach tube. Under fluoroscopic guidance by Dr. Karl Kornblum, the gold denture could be visualized in the stomach at the greater curvature (fig. 2 *A*). The sheathed forceps was introduced until the tip came near the foreign body. A small amount of air was then insufflated and the foreign body was released from the stomach folds and was easily grasped by one of the sharp points of the clasp that had been constructed to hold the denture in place in the mouth. This grasp on the foreign body protected the sharp points, making it safe for withdrawal through the esophagus. As the foreign body was withdrawn to the level of the diaphragm a small quantity of air was insufflated, and the foreign body came easily into the esophagus. Slight difficulty was encountered as the foreign body was brought through the cricopharyngeus, but it came readily through the esophagus without trauma (fig. 2 *B* and *C*). The procedure required only a few minutes, the patient experiencing only slight discomfort.

CASE 2.—A baby girl, aged 6 months, admitted to the Graduate Hospital of the University of Pennsylvania, choked on a safety pin the night previous to her admission. Roentgen examination showed the pin to be in the esophagus just entering the stomach. The child was placed on a fluoroscopic table, and the child size sheathed flexible forceps was introduced. As the forceps passed downward in the esophagus the pin passed on to the greater curvature of the stomach. The forceps was introduced into the stomach, a small amount of air insufflated and the pin manipulated with the forceps. The sheath of the forceps was retracted so that the pin could be grasped with the rotation blades in the ring (fig. 4 *A*). A cephalic version was done with the pin and it was withdrawn with the point downward (fig. 4 *B*). Slight difficulty was encountered in getting the pin out of the pharynx, and in any future case in an infant I should introduce a laryngoscope into the hypopharynx and lift the larynx and base of the tongue forward as the pin comes through the upper end of the esophagus (fig. 5).

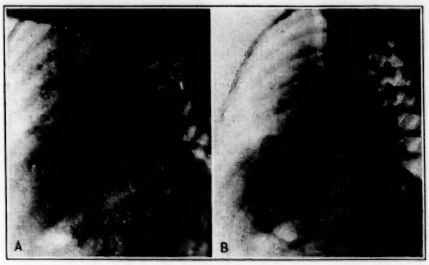

Fig. 4.—*A*, sheathed flexible forceps grasping the open safety pin in the stomach in a child, aged 6 months. *B*, open pin after cephalic version, withdrawn into the lower end of the esophagus with the sheathed flexible forceps. Roentgenograms by Dr. Karl Kornblum.

COMMENT

1. It is believed that the proposed method of removal of foreign bodies from the stomach with the author's sheathed flexible forceps is safe and effective and will produce less discomfort than the ordinary method of gastroscopic foreign body removal.

Fig. 5.—Safety pin removed from the stomach with the sheathed flexible forceps under fluoroscopic guidance.

2. Owing to the fact that air can be insufflated through the forceps, the operator can at all times determine readily the position of the foreign body with relation to the cavity of the stomach, and the stomach folds can be obliterated so that the foreign body can easily be grasped.

3. The instrument should be used by those who are experienced in endoscopic work and intraesophageal manipulations. Biplane fluoroscopic guidance with the aid of an expert roentgenologist who has developed with the endoscopist a team for the removal of foreign bodies under fluoroscopic guidance is an indispensable part of the technic.

4. Because of the fact that the patient can be rotated and the position changed with safety while under fluoroscopic observation, the method will permit the removal of foreign bodies that would be inaccessible to the ordinary gastroscopic method.

326 South Nineteenth Street.

AN OUTBREAK OF FOOD POISONING APPARENTLY DUE TO STAPHYLOCOCCI

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A number of outbreaks of food poisoning due to staphylococci have been studied in recent years. Jordan and Burrows[1] have cited nine such outbreaks.

The outbreak reported here is of interest since it involved a large number of people (206) and since specimens of food collected immediately following the illness were refrigerated and later frozen, so that the bacteriologic analyses are representative of the foods at the time of consumption.

A recent outbreak of food illness occurred in a group from one of the shelters of the federal Transient Service Activities in Indianapolis. The men affected were only those on outside work relief projects. The menu, outlined by a trained dietitian, was served throughout all transient centers in the state with identical foods, the same meat, from the same source lots of food products of standardized quality from recognized reputable packers. The outbreak did not occur or recur in the other shelters in the same city. Lunches were prepared for these men on Thursday, June 13, 1935, between midnight and early morning. The lunches consisted of sandwiches wrapped in wax paper, which were put up in bags and given to the men in the morning when they were sent out on work relief projects. Records were obtained from 206 men who were ill and 161 who were not ill, although a total of 471 men were sent out with the same lunch. The lunches were eaten at about 11:30 a. m., and about 2 p. m. of the same day the men affected were seized with epigastric distress, vomiting, diarrhea and marked prostration, the acute symptoms lasting for several hours.

A sharp rise in temperature following a long period of rain came during the day (90 F.) as a contributory factor. The ingestion of varying grades of alcohol from canned heat, but not always admitted on interview, malingering, and the psychic element were no doubt also contributory factors. One other suspicious factor was a much used driven well near an old fish pool in a nearby city park. Although not dangerously contaminated or unsafe for drinking purposes, it has since been closed.

The epidemiologic data are summarized in table 1.

From a study of table 1 it is obvious that the greatest number of men were ill in the group eating the tongue sandwiches. Since 206 men became ill and 187 of this number ate tongue sandwiches, the difference of nineteen must be explained. Gastro-intestinal upsets might well have occurred in this small number (nineteen) simply from being with the others who were so violently ill.

A thorough general chemical analysis of all mentioned foods for extraneous poisons was negative; this analysis was made by one of us (R. N. H.).

A bacteriologic examination was made of the following specimens:

1. Pickle
2. Scraps of bread from sandwiches
3. Jelly sandwich
4. Jelly used for preparing sandwiches
5. Tongue from sandwich
6. Crumbs of bread from tongue sandwich
7. Cheese sandwich
8. Tongue—stock used in making sandwiches
9. Fig
10. Sugar
11. Cream—evaporated milk
12. Coffee
13. Vomitus
14. Cheese
15. Peanut butter from sandwich
16. Bread from peanut butter sandwich

Portions of the solid specimens were emulsified in sterile salt solution. One small loopful of each specimen was streaked on blood agar and eosin methylene blue agar plates. Serial dilutions were made and pour plates prepared, veal infusion agar and eosin methylene blue agar being used. The plates were incubated for twenty-four hours and then examined. Some of the plates showing no growth were incubated for an additional period of twenty-four hours, after which they were again examined.

Numerous hemolytic Staphylococcus aureus colonies were present on the blood agar plates streaked with samples 2, 5, 6 and 8. These staphylococcus colonies predominated over all others in the plate containing specimen 2. No paratyphoid organisms were found on any of the eosin methylene blue agar plates. No growth occurred on the eosin methylene blue, blood agar or veal infusion agar plates inoculated with samples 1, 4, 10, 11 and 12. Green streptococci were present in samples 7 and 9. No organisms of known significance were found in any of the other samples.

TABLE 1.—*Epidemiologic Data*

Food	Ill	Not Ill	Total
Tongue sandwich	187	85	272
Peanut butter sandwich	148	123	271
Cheese sandwich	162	126	288
Jelly sandwich	162	149	311
Coffee and cream	127	104	231
Coffee without cream	14	13	27
Pickle	138	101	239

The large number of hemolytic yellow staphylococci in the scraps of bread from the sandwiches and the presence of these organisms in the tongue, together with the statistical data on the foods eaten, seemed further to incriminate the tongue sandwiches as the source of the food poisoning. Strains of these staphylococci were therefore isolated from samples 2, 6 and 8. These cultures were tested for food poisoning toxic substance by feeding experiments on Macacus rhesus monkeys. For this purpose the cultures were inoculated into 1 per cent veal infusion agar, p_H 7.0, and grown in an environment of about 25 per cent carbon dioxide for thirty-nine hours at an incubation temperature of 37 C. After incubation, the agar was removed by filtering through cheese cloth, and the remaining liquid culture was fed to the monkeys. Each culture was fed by stomach tube to two monkeys. The results are listed in table 2.

TABLE 2.—*Results of Culture*

Monkey	Culture from Specimen	Amount Fed	Results
1	2	45 cc.	Vomited 40 minutes after feeding
2	2	45 cc.	Several paroxysms of vomiting beginning 2½ hours after feeding
3	6	55 cc.	Several paroxysms of vomiting beginning ½ hour after feeding
4	6	55 cc.[2] Much of sample regurgitated at time of feeding	No reaction in 4½ hours
5	8	45 cc.	Several paroxysms of vomiting beginning 25 minutes after feeding
6	8	48 cc.	Vomited 3½ hours

The results obtained by feeding cultures of the yellow hemolytic staphylococcus isolated from the scraps of bread (sample 2), the crumbs of bread from the tongue sandwich (sample 6), and the tongue used in making the sandwiches (sample 8) indicated that these strains were of the food poisoning type.

The presence of the food poisoning type of hemolytic yellow staphylococci in the tongue could well account for the distribution of this organism in the sandwiches. The absence of this organism in the cheese sandwich (sample 7) and the bread from the peanut butter sandwich (sample 16) would indicate that the bread was not the source of these organisms. When proper conditions of moisture and temperature occur, the organisms probably spread into the bread from the meat filling of the sandwich. This spread of the bacteria is associated with growth of the organism with apparent elaboration of the toxic substance responsible for food poisoning. Favorable conditions for the development of this organism were not attained in all cases, since many of the men eating tongue sandwiches did not become ill.

There were no fatalities directly traceable to the food poisoning, although one death followed about a week later from pneumonia. All made a rapid uneventful recovery within a few hours.

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1. Jordan, E. O., and Burrows, William: Am. J. Hyg. **20**: 604 (Nov.) 1934.

CONCLUSION

A food poisoning outbreak involving 206 men was apparently due to eating tongue sandwiches that were contaminated with a yellow hemolytic staphylococcus. The staphylococci were shown by monkey feeding experiments to be of the food poisoning type.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING ARTICLE AND REPORT.

HOWARD A. CARTER, Secretary.

LIGHT THERAPY AND ROENTGEN THERAPY IN TUBERCULOSIS

PRESENT EVALUATION

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Light therapy, both natural and artificial, is of definite value in the treatment of some forms of tuberculosis. There is still considerable difference of opinion on which regions of the light spectrum are most efficacious, as well as confusion as to the tuberculous conditions that respond best to this treatment.

Natural heliotherapists, especially those working in high altitudes, emphasize solar radiation and aerotherapy. On the other hand, those in cloudy climates have stressed the use of artificial lights and still others, on occasion, the x-rays.

CLINICALLY EFFECTIVE SPECTRAL REGIONS

There is much dispute as to the relative therapeutic values of infra-red, visible and ultraviolet rays, but, unfortunately, most observers, enthusiastic over their own results, seem to be biased in their opinions. The effective heat rays of the light spectrum lie at the red end and include visible red and invisible infra-red rays, while actinic rays found at the other end comprise that visible region extending from the blue, through indigo, violet and the invisible ultraviolet rays.

Sonne found that the infra-red heat rays from the carbon arc light set up a cutaneous erythema leading in animals to the production of blisters through rapid elevation of the skin temperature. The luminous heat rays, on the other hand, without producing bodily fever could heat a very essential portion of the aggregate blood volume of the body to a temperature possibly exceeding the highest bodily temperature ever measured. Those stressing therapeutically the heat radiation have described experiments in which animals whose body temperature has been elevated to a high degree have shown extreme tolerance of infection. Rabbits subjected to exposures of dry heat sufficient to increase activity of the lymphoid organs have been shown to develop on immunization antibodies in much larger quantity than did untreated animals immunized in the same fashion.

Danish workers stress particularly carbon arc radiation for all types of tuberculosis. This arc emits much visible red and invisible infra-red energy. Its total visible rays furnish energy equal to about 20 per cent of its aggregate radiant energy, and this is increased proportionately with its ampere volume.

Hyperemia due to heat radiation has been credited with favorable clinical results. Bier and others employed heat lamps at high temperatures which produced hyperemia of long duration and elevated the cutaneous temperature to that produced by sunlight; rapid clinical recoveries ensued.

Bernhard of St. Moritz, a pioneer in solar therapy, never filters out the infra-red in his treatment of wounds. He ascribes his recoveries to the green-yellow and shorter infra-red rays. This was borne out by poor results of wound healing obtained with ultraviolet rays emitted by the mercury vapor arc in quartz.

The physiologic effects of radiant heat energy suggest that clinical results of therapy with sunlight are at least in part dependent on the red and infra-red region.[1] Most recently the response of certain forms of superficial tuberculosis, especially of the skin, to heat radiation, speaks very clearly for this.

The exact part played in the clinical usage of light by the total visible spectrum is difficult to say, although in all probability it is in some way physiologically effective.

The rôle of ultraviolet energy has been much more definitely established through animal and human studies in calcium-deficient diseases in which it has specific effect. Furthermore, in tuberculosis, on the basis of the quality of ultraviolet wavelengths and of the results obtained at the seashore, at inland sea level and in the mountains, Danish workers are convinced that ultraviolet energy of the region longer than 313 millimicrons is the one effective in the treatment.

The additional part played by the action of moving air on the skin in the solar treatment of extrapulmonary tuberculosis must not be discredited. Probably the combination of all factors contributes to the end result.

MERCURY VAPOR ARC IN QUARTZ COMPARED WITH CARBON ARC LIGHT[2]

The radiations of artificial sources represent approximations to sunlight and no two sources are alike in respect to the distribution of the energy they emit. Therefore different sources do not produce the same physiologic or therapeutic action. The energy emitted by various artificial sources varies in intensity and in spectral distribution. The intensity of the radiation of sunlight on the earth's surface varies considerably, particularly on account of location, season and time of day. It will vary as much as 5 per cent in total intensity and a variation of 5 to 10 times in noon-hour ultraviolet winter to summer.

In the choice of an artificial source of light, one must consider the quantity and quality of the energy emitted by the lamp. A sufficient quantity of radiation must be present which corresponds to the particular parts of the spectrum found most efficient in the disease to be treated. Under different conditions all parts of the light spectrum will yield results if particular conditions demand the wavelengths that a special source of light emits strongly.

For therapeutic purposes the sun, the mercury vapor arc in quartz and the flaming carbon arc burning cored carbons filled with mixtures of carbon dust and metals have been the chief ones of practical importance. The mercury vapor lamp has been particularly developed for its emission of ultraviolet, although it emits also well in the visible part of the spectrum. Its ultraviolet component represents between 9 and 28 per cent

From the New York Hospital and the Department of Medicine of Cornell University Medical College, New York.

1. Pemberton, Ralph: Influence and Therapeutic Use of Heat, J. A. M. A. **105**: 275 (July 27) 1935.
2. Laurens, Henry: Factors Influencing the Choice of a Source of Radiant Energy, J. A. M. A. **103**: 1447 (Nov. 10) 1934

of the total energy of all wavelengths emitted by the lamp. A carbon arc consuming 25 amperes or more and burning specific carbons, such as "sunshine" carbons, closely approximates highland sunshine. Carbon arcs of varying amperage and with special cored carbons will emit, almost according to the needs, widely varying intensities in many regions of the light spectrum.

An important question in the selection of these various sources of light is the minimum ultraviolet radiant power that a source must emit in order to insure effective therapeutic action. The amount of ultraviolet that can be applied to the body without producing a burn depends on the tolerance of the skin. The erythemal reaction is really the only physiologic one that is established with a relatively high degree of accuracy. As a criterion it is a simple and practical means of preventing severe burns and as a reaction it is a good means of judging the effectiveness of a lamp.

Exact clinical indications for different sources of light have not yet been defined. For rickets and tetany, both the carbon arc and the mercury arc as well as sunlight have proved curative. For extrapulmonary tuberculosis, as that of the skin, bones and joints, intestine, peritoneum and lymph nodes, both sources of light have had strong adherents and both have shown their value. The enthusiasts for solar treatment will insist that a spectrum closely approximating that of sunlight is necessary, and therefore they particularly advocate certain carbon arcs. Others who have gotten favorable clinical results with mercury quartz lights argue in their behalf.

The conditions, clinical and otherwise, indicating the selection of one source of light in preference to others depend in part also on the convenience of usage, the availability of the source of light, and the cost of running. In the past, carbon arc lamps of high amperage have been more generally applied for exposures of groups. The mercury quartz lights are now applicable for exposures of groups as well as individual patients. The carbon arcs of lower amperage, as well as mercury arcs, can be used for single patients. Irradiation with artificial light, as ordinarily employed indoors, lacks some apparently important accompaniments of outdoor solar exposures, such as constantly moving fresh air with its deeper effects produced through the skin and respiration, and in colder weather the uniform warming of the whole cutaneous surface with its production of a sense of comfort, well being and relaxation. Workers aim to produce this with artificial sources of light and some added means of ventilation indoors.

PULMONARY TUBERCULOSIS

For uncomplicated pulmonary tuberculosis, no clinical evidence is at hand to prove the indication for light therapy. The lack of accurately controlled observations among certain workers makes it necessary to accept their favorable reports most cautiously. Until contrary evidence is at hand, uncomplicated exudative pulmonary tuberculosis is a contraindication to light therapy; with proliferative or fibrotic pulmonary tuberculosis, which may be accompanied by elevation of temperature, sunlight or artificial lights, if employed at all, should be used cautiously. Intense sunlight should be avoided, and diffuse daylight or early morning and late afternoon sunlight should be used. Focal or constitutional reactions should be watched for. The indications here resemble those of tuberculin therapy.

In pulmonary tuberculosis, even when quiescent, harm has been done by sunlight exposures, especially with too intense and prolonged irradiations. Solar heat alone, especially in summer, can prove very exhausting. An observing patient will note fatigue, exhaustion, irritability or even overstimulation after these solar baths. With this reaction, sunlight should be discontinued. If symptoms are due to overdosage only, exposures may be resumed after an interval, shorter or less intense exposures being employed. Increase of local symptoms, such as cough and expectoration, and pleurisy, or of systemic symptoms, such as elevated pulse and temperature, serves as a guide. In these cases it may be advisable to substitute irradiations of diffuse daylight of longer duration, or of low intensity sunlight in the early morning and late afternoon hours.

A moot question is the exposure of active febrile pulmonary tuberculosis, with or without extrapulmonary complications, to light irradiations. As regards x-ray exposures, workers with extensive experience caution strongly against irradiating exudative pulmonary tuberculosis but emphasize as suitable only the stationary proliferative and fibrotic forms with little or no fever. Do similar indications hold for light radiation?

Lo Grasso and others have employed sunlight of weak intensity (in the early morning and late afternoon hours) for uncomplicated febrile pulmonary tuberculosis and have claimed favorable results. On the other hand, the reports of Bronfin from the sunny resort of Denver and of Jacquerod in Leysin, Switzerland, contradicted this. My own experience is strongly in agreement with the latter.

In an active febrile pulmonary tuberculosis complicated by active intestinal tuberculosis, mercury quartz irradiations have been regularly used by many for the intestinal complication and not infrequently with favorable effect. In such cases the activity and nature of the pathologic changes of the pulmonary disease have been disregarded. The favorable empirical results thus obtained and the poor results obtained when other treatments have been used justify this as an indicated therapy.

For other forms of active extrapulmonary tuberculosis, such as that of bones and joints, or lymph nodes complicating active pulmonary tuberculosis, light exposures have been often used to advantage, so that the pulmonary disease, if not rapidly progressive, offers no contraindications. However, careful observations, especially in exudative forms of pulmonary disease, will not rarely reveal the development of harmful pulmonary focal reactions due to excessive exposures to light. This should deter one from exposing such patients indiscriminately.

Focal reactions have been shown to occur in the lungs, even when direct sunlight is reflected in overdosage on a tuberculous larynx. Some workers observed their occurrence when the limbs alone were irradiated with the mercury quartz and carbon arc lights. In the use of both lamps and sunlight, one often notices on beginning treatment a slight elevation of temperature with mildly increased focal pulmonary symptoms. This reaction has been likened by some observers to a tuberculin reaction. Jesionek believed that the pigment could act specifically, just as tuberculin, and that when carried by the blood it set up a focal reaction such as he had observed in the lungs, larynx and joints. He obtained these only in cases in

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which good pigmentation developed, and a latent period always existed before signs of the reaction appeared. By the screening of lupus areas from the light and exposing the rest of the body, the diseased tissue has often healed, indicating apparently the transport by the blood of some substance to the focus. However, therapy is preferably carried out by exposing the diseased parts in addition, because the local inflammatory reactions obtained through direct irradiations may be of importance.

In tuberculosis of the urinary bladder, under general irradiations, small nodules have been reported to develop in the bladder, which were considered as focal reactions. In animal experiments irradiation of the posterior part of a frog's body produced vascular changes in the retina. Isolated instances of disappearance of tubercle in the retina under general irradiation have been cited. Reyn and Strauss found that thirty cases of lupus, which had not been affected by previous local treatment, healed when general irradiations were added.

After an experience of eight years with irradiation from the mercury quartz lights of 655 patients in all stages of tuberculosis and with thousands of exposures, Godde reported definite focal reactions set up in fifty-seven of them, manifested by an increase of constitutional symptoms and a spread of the pulmonary disease. He was strongly of the opinion that quartz light treatment was not a harmless procedure and might do damage unless the irradiations were carefully graded and slight reactions were heeded. Other workers, including Marfan, Grau, Brecke, Bacmeister and Harms, have similarly warned against such focal reactions.

Harm due to irradiation of patients with pulmonary tuberculosis results almost always from an indiscriminate use of light, with overdosage. It manifested itself in my experience with increased local symptoms; namely, increased cough and expectoration, localized pain, blood-streaked sputum or hemoptysis, and, following these, fever and tachycardia. The exposures had then to be shortened, discontinued or given over less surface of the body. I have seen genito-urinary tuberculosis become definitely aggravated because of overexposure.

Even though only occasional undue focal reactions happen, caution is justified. They can easily be avoided. Their importance has been emphasized to warn against careless usage of light with little regard for dosage.

Roentgen therapy of pulmonary tuberculosis is effective for the proliferative and fibrous forms when the disease is stationary. The response is characteristically slow. Exudative tuberculosis is a contraindication. Overdosage produces damaging focal reactions, often of caseous pneumonia. The best results are had with doses of about three fourths to four fifths of an erythema dose. The quality of the rays should vary according to the depth, extent and nature of the pathologic condition. Tumor or tolerance doses should not be used for tuberculosis.

PLEURAL TUBERCULOSIS

Pleural tuberculosis, dry or serous, especially if it is the initial clinical manifestation, is occasionally aided by light therapy. The acute serous form is not to be irradiated. A tuberculous pleurisy with no obvious pulmonary disease usually responds to ordinary rest and hygienic-dietetic treatment; those cases not responding after about a month of such treatment may call for irradiations. Pleurisies occurring in the course of obvious pulmonary tuberculosis, as well as pneumothorax cases, offer the same indications as the lung disease. Tuberculous empyemas do not respond. If sinuses are present, they are rarely helped by local and general light applications. Pleural tuberculosis in the Negro, peculiarly enough, has been cited as favorably responsive to light.

LARYNGEAL TUBERCULOSIS

Laryngeal tuberculosis is practically always secondary to pulmonary tuberculosis, so that the indications for the treatment of the larynx depend on the nature of the disease in the lungs. Here, again, light by itself is not curative but exercises its part only as an adjuvant to the other mainstays of treatment. These, in addition to the enforced rest and hygienic regimen, include local measures to the larynx applied as they are indicated. Such local measures in particular include absolute vocal rest (silence), local medications and sprays, and local application of the galvanic cautery. General light exposures are made to the body, with at times additional laryngeal local exposures. The acute forms of laryngeal tuberculosis, particularly those with edema, are not indications for light therapy.

Often vocal silence and bodily rest comprise the only treatment required for healing this complication of pulmonary tuberculosis. A large percentage of the patients will get well in this way and frequently, therefore, the irradiation employed is unjustifiably credited with the result. If these measures have not brought about improvement in the larynx within a reasonable time, light exposures are indicated.

Local exposures of sunlight may be made by means of metallic reflectors (chiefly magnalium). With artificial sources, local irradiation has been carried out by reflected light through special means devised to employ the maximum intensity of ultraviolet or by direct irradiation through quartz applicators attached to water-cooled mercury arcs or through especially constructed direct water-cooled sources of light. Exposures are made with the aim of producing a mild focal reaction, the reaction being allowed to subside before the next exposure is made. Those patients in whom mild focal reactions developed through irradiation showed often a greater tendency to heal, but no advantage to be gotten from a local treatment to the larynx is cause enough to compel a patient to leave his bed when his active disease indicates bed rest. Furthermore, general body irradiation in this complication plays a large part.

Direct local exposures have been made with a special carbon arc through a Seifert apparatus, originated at Hayek's clinic in Vienna. This is a direct irradiation procedure in which the epiglottis is elevated and the pharynx and larynx are narcotized as for direct laryngoscopy. The patient (lying down) then receives direct exposure of the larynx, ranging from one to fifteen minutes, depending on the stage of treatment and the reactions. Exposures are made generally biweekly and extend over a period of a year or more The results with all these local irradiating methods must still be adjudged with caution.

The electrocautery is one of the best methods of treatment in laryngeal tuberculosis and is the form of local treatment most used by laryngologists with experience in handling this disease. Local light therapy has proved useful as a postoperative measure in cauterization cases, and as a sedative measure in cases in which cauterization cannot be done.

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In lymphatic tuberculosis, irradiation is a most important aid to hygienic cure. X-rays have not proved of much therapeutic value. The treatment is claimed to effect as many as 90 per cent of clinical cures; but many of these, when the node proved refractive to light, have yielded only to roentgen therapy.

Tuberculous lymph nodes may be seen clinically in three different stages; namely, as enlarged nodes which have undergone hyperplasia, as nodes which have proceeded to the stage of caseation and softening, or as softened nodes which have perforated to the exterior through a sinus tract. In the first stage, general body exposures to repeated erythema doses of light are not infrequently followed by an inflammatory reaction at the nodes with slight pain, tenderness and swelling. In the majority of cases the inflammation subsides and the lymph node finally heals. About 30 per cent of these appear to show no tendency to heal under light alone, but with the addition of x-rays a large number of these also will improve. Occasionally, nodes in the hyperplastic stage may become caseous under light treatment and at times may have to be treated surgically by excision. In such instances light is of great value when used postoperatively in preventing the formation of tuberculous sinuses. In the second stage of caseation, light exposures alone will frequently bring about resolution. When softened lymph nodes reach the stage of fluctuation, aspiration or incision is necessary, and then light is most effective. In the third stage, excellent results are obtained in clearing up sinuses of long standing, but occasionally x-ray exposures may have to be combined with light treatment for complete healing to take place. Local irradiation of the sinus area should be made in addition to general irradiation of the body. In cured cases, exposures have averaged from three to eight months.

General body exposures are usually combined with those to the nodes or sinuses. In addition, repeated aspiration, when possible, is made of any fluctuating node, generally entering with the needle from above. At times incision into a softened node is necessary. If the nodes do not heal with these measures, x-rays are resorted to.

The prognosis will vary frequently, depending on whether the patient has also pulmonary tuberculosis and what the prognosis of the pulmonary disease alone will be.

For nodes not yet broken down, local and general sunlight or artificial light exposure, together with the application of x-rays, is the treatment of choice. In the softening stage of tuberculous adenitis, treatment is first best attempted with sunlight or sunlamps and without x-rays. Aspiration is usually necessary. However, x-rays may well be added as soon as the softening subsides. With sinuses occasionally the use of radiant heat may help to close them if combined with sunlamp exposure. In addition, it is always necessary to search for and treat all possible foci of infection in the upper respiratory tract. Tonsillectomy is frequently required for cervical adenitis, but in the presence of acute fluctuating tuberculous nodes of the neck this procedure should be postponed until the suppuration is overcome.

With roentgen therapy, hyperplastic lymph nodes react at first with swelling and pain. Later the nodes separate and gradually decrease in size. When they have become hard, small and movable, it is unnecessary to irradiate them further. Tuberculous lymph nodes regress slowly after roentgen therapy and, as a rule, only after numerous exposures. If a mass of lymph nodes disappears rapidly after two or three exposures, the tuberculous nature of the disorder is doubtful. Caseous lymph nodes may break down under x-rays, and aspiration often then becomes necessary. Softening lymph nodes are better influenced by light, particularly sunlight. The most gratifying results are obtained with x-rays when used for nodes in the infiltrative stage. Changes produced by x-rays are possibly a cellular inhibition and necrosis, resulting in secondary fibrosis of the lymphatic channels.

The dosage of x-rays should be fractional or suberythema in amount, administered at monthly intervals for from eight to twelve months.[3] When the condition is deep seated, a 3 mm. filter of aluminum should be used. The initial dose for infants and children must not exceed one-third skin unit, for adults three-fourths unit. Owing to the relatively great radiosensitivity of the lateral and anterior cervical cutaneous surfaces, even a mild reaction is to be avoided. The doses are to be increased cautiously, the skin being inspected carefully each time for signs of saturation. Overtreatment is apt to result in disfiguring x-ray reactions such as telangiectasia, atrophy and scarring. In young subjects undergoing prolonged treatment of the neck and mediastinum, care should be exercised to avoid irradiating the thyroid and thymus glands. It is seldom possible in adults to apply more than one skin unit to the lateral surface of the neck without evoking a slight erythema.

Roentgen therapy for adenitis has several advantages over surgery. It is less dangerous than operation, with no chance of introducing tubercle bacilli into the circulation, no bad cosmetic effect, and rare recurrences. The skin of the neck, however, is quite sensitive and great skill must be exercised. Some workers claim that damage has been done even to the larynx, but this means that the quantitative dose was too large. It has been shown experimentally that the virulence of pus from abscesses can be markedly diminished by exposure to x-rays. Although there is little uniformity of opinion as to the roentgen treatment of other forms of tuberculosis, the results as expressed by most workers with lymphatic tuberculosis are favorable. As stated before, when these exposures are employed, general light baths (sun or artificial sources), together with rest and hygienic routine, are carried out in addition. There are obstinate cases, of course, in which at times conservative treatment fails, and under such circumstances surgical excision must be resorted to; but in the largest number of cases this is not necessary.

SECONDARY ULCERATIVE INTESTINAL TUBERCULOSIS

Secondary ulcerative intestinal tuberculosis is the most frequent complication of pulmonary tuberculosis, occurring in from 50 to 80 per cent of the patients who die of pulmonary tuberculosis, as revealed by autopsies.

Artificial light and solar therapy, as well as a rich vitamin diet, should be used in most cases, as they frequently relieve the symptoms and bring about recovery. When the desired results are not obtained by light therapy, roentgen treatment of the intestinal tract should be carefully given or other additional measures employed.

Excellent results are obtained with the use of artificial sources of radiation, with general exposures either

3. MacKee, G. M.: X-Rays and Radium in the Treatment of Diseases of the Skin, Philadelphia, Lea & Febiger, 1927, pp. 601-605.

of the mercury arc in quartz or carbon arc sources. The results depend on factors such as the general status of the patient and the location, extent and nature of the disease in the intestine. Those with far advanced pulmonary and intestinal tuberculosis with little remaining resistance cannot be expected to respond, but intestinal tuberculosis today is healed in many patients, and autopsies have often confirmed this.

It is seen that, with light exposures and hygienic treatment, the symptoms referable to the intestinal tract generally vanish during the first few months of irradiation, but the exposures should be continued for at least six months to two years. The loss of symptoms is frequently surprising, abdominal pain and discomfort disappearing, diarrhea and fever subsiding quickly, and general improvement taking place. Roentgenologic studies show that the intestinal irritability as visualized by x-ray defect clears up entirely in many instances. It is usually best to continue light therapy for many months after an apparent cure has occurred.

Patients who do not respond to light should be given roentgen treatment. An exposure should be made weekly, with rays generated at a voltage of 135 peak kilovolts and filtered with 4 mm. of aluminum, with the tube at a distance of 35 cm. General body exposures to light combined with local roentgen irradiations in suitable doses often yield results superior to those obtained with either alone.

With x-rays, the abdomen should be irradiated uniformly. This part of the trunk should be divided into four anterior and four posterior fields, with the navel as the common center of the four fields. The two upper should extend from the level of the diaphragm to the navel, the two lower fields from the navel down to and including the pubic region. If the quantitative dose of x-rays is no greater than three fourths or four fifths of an erythema dose, there is almost no danger of intestinal reaction or complication. Smaller amounts are insufficient to affect a tuberculous lesion within the abdominal cavity. Irradiations should be repeated at intervals of four weeks and continued for from three months to a year.

105
935

PERITONEAL TUBERCULOSIS

In peritoneal tuberculosis, light therapy always deserves a trial first. The serous exudative type generally responds to light irradiation, both in children and in adults. The dry proliferative form, usually adhesive, is more refractory. When there have been ulcerations and large caseous lymph nodes, as commonly seen in children, the results are most unsatisfactory. When the disease is of long standing, healing is more difficult than when irradiation is begun a short time after onset.

Pain under light therapy usually disappears rapidly, especially in children. Large quantities of ascitic fluid may disappear in a few months.

With roentgen therapy the dosage employed and the technic of irradiation are the same as for intestinal tuberculosis. The results with roentgen therapy are at times surprisingly good. Surgery is often resorted to. Not infrequently, merely opening the abdomen has resulted in clinical cures, just as has the institution of pneumoperitoneum.

GENITO-URINARY TUBERCULOSIS

If unilateral renal tuberculosis is diagnosed at the very onset of symptoms and when such symptoms are slight, conservative treatment with light therapy has on rare occasions prevented the need of surgical intervention. As a rule, nephrectomy is indicated.

For unilateral progressive renal tuberculosis or bilateral disease in which the more involved kidney is removed, light therapy is to be advised as a desirable postoperative treatment. It may have a favorable action on the genital organs and the remaining kidney and effectively contribute to the healing of a tuberculous cystitis, whether alone or in association with medical treatment. Light therapy exercises a healing action on the stump of the ureter, which so often shows residual ulceration, resulting in a discharging sinus or a persistent cystitis. It has given excellent results, even with chronic gaping wounds, extensive and deep, and even when covered with ulcerations and tuberculous granulations. The edges of the wound are separated and held apart with broad strips of adhesive plaster to allow the light rays to penetrate the depths and to prevent formation of a closed pocket, which would favor purulent retention as a result of a premature superficial closure. Such extensive wounds may heal with a linear elastic scar and often are hardly visible in the pigmented skin.

Light is particularly indicated in those not infrequent cases of renal tuberculosis complicated by genital tuberculosis in which the seminal vesicles and prostate are involved, thus often obliging postponement of cystoscopy to avoid trauma of the prostate and the risks of general infection. In such cases it is imprudent to consider the kidney disorder as an independent lesion, for it is but one manifestation of tuberculosis affecting the whole genito-urinary system. Therefore, before surgical intervention it is advisable to treat the concomitant lesions with a methodical course of light therapy to make cystoscopy and nephrectomy procedures of less risk of dissemination.

In bilateral renal tuberculosis, light therapy is indicated. It may help render the disease quiescent; its occasional analgesic action on ulcerations of the bladder is particularly welcome. It is in these cases of bilateral tuberculosis that advanced infection implicating the genital tract is so often encountered. While the renal lesions tend to become stationary, there is often a steady regression and improvement of the prostatic and bladder lesions and their clinical symptoms.

Advanced bilateral renal and bladder tuberculosis has rarely responded to any form of therapy, especially when the patient is cachectic. Pain has occasionally been relieved by light exposures, but the frequent urination is very resistant. Occasionally removal of the more diseased kidney has temporarily relieved the symptoms. Postoperative sinuses, especially following nephrectomy, have responded in a large number of cases to light therapy of all forms.

Circumscribed tuberculous lesions of the urinary bladder have improved under local intravesical exposures of ultraviolet radiations from the low pressure cold mercury discharge.

Roentgen therapy has not proved of value in this form of disease except in occasional instances, for the healing of fistulas. Tuberculosis of the epididymis and testicle has occasionally given favorable response to x-rays.

Generally, when the disease is confined to the epididymis, surgical excision is indicated as a very simple and safe procedure. Excision of the testicle may or may not be indicated, depending on the stage of its involvement, whether the vesicles and prostate are also

involved, and whether the disease is caseous or fibrous. At times complete radical excisions of the whole tract or the major part of the tract are indicated.

BONE AND JOINT TUBERCULOSIS

In bone and joint tuberculosis, heliotherapy, although not the mainstay of treatment, is always employed in combination with other forms of therapy. Orthopedic measures, rest in the open and light form the basis of conservative therapy.

Combined conservative treatment includes orthopedic measures, such as immobilization of joints, traction, and careful use of passive and active motion; use of light, air, tuberculin and diet; judicious application of surgery, and, rarely, roentgen therapy.

There are at present three definite schools of treatment, each with adherents. The first emphasizes the need for surgical intervention, especially fusion, in all cases of joint tuberculosis. This school maintains that cure can occur only through ankylosis and that this ankylosis is produced more rapidly and safely by the surgeon than by nature.

The second school, as represented by Rollier, is rigidly set against surgery except in unusual instances. This school holds that light therapy with orthopedics can do far more than the surgeon's knife. The latter destroys while radiation heals.

The third school adopts a more conservative attitude. Its leaders think that the problem of joint tuberculosis is much too complicated and difficult to be settled by one mode of attack and that in each instance numerous points of view and fine differentiations must be considered in reaching the maximum therapeutic effect. Surgery, solar therapy, artificial light therapy, braces, even in some cases the much maligned plaster-of-paris cast, all have their place in the treatment of bone and joint tuberculosis. Only the future can decide which of these three schools comes nearest to the truth, although advocates of surgical fusion are steadily increasing.

Light therapy must be admitted to be a real addition to our resources. It is not to be expected that it will produce new cartilage in place of that which has been utterly destroyed; it does not make the process of fusion less necessary than it has been hitherto, but it can help this develop. It is wrong to expect that its use will bring about regeneration of bone equal to that of a few vertebral bodies when they have been destroyed; but when this has occurred and a gibbous deformity exists, light therapy has aided orthopedic treatment in fusing these diseased surfaces, especially when employed together with postural treatment.

Surgical fusions are less commonly performed on children under 12 years of age. If performed on adults or children, the disease must first show some evidence of retrogression; thus surgery is to help nature. Following operation, patients are still treated for from one to two years, and during this period heliotherapy plays an important part.

Both mercury arc in quartz and carbon arc irradiations, employed as general and local exposures for prolonged periods of time, have proved aids in the treatment of bone and joint tuberculosis. The technic of irradiation is the same as that described with other forms of tuberculosis. With early exposures, the joints or bones often respond with increase of the local swelling and pain and, if a sinus is present, increased secretion. These in turn subside. Small joints yield more quickly to treatment than large ones. The knee joint is refractory, and particularly obstinate are old fistulas of the spinal column, pelvis or hip. Treatment demands two years or more in many instances.

Roentgen therapy is occasionally added and has at times shortened the period of treatment. As a rule, however, it is not enthusiastically advised except in involvement of the smaller and superficial bones, those of the tarsus, metatarsus, carpus, metacarpus, fingers and toes, sternum and ribs. Even with these, results are not rapidly obtained. In tuberculosis of the spine, hip, knee and sacro-iliac joint, x-rays are practically never used.

OTHER FORMS OF TUBERCULOSIS

Various other forms of tuberculosis indicate light therapy. With the cutaneous tuberculoses, lupus vulgaris responds almost specifically. Scrofuloderma and erythema induratum react less constantly but very favorably at times. Papulonecrotic tuberculids are resistant. Lupus erythematosus is often aggravated by light. Tuberculous ulcers of the mouth and pharynx, usually secondary to advanced pulmonary or laryngeal tuberculosis or to hematogenous dissemination, are most resistant. Electrocoagulation is a more effective therapy.

X-rays are of definite value in most cutaneous tuberculoses due directly or indirectly to the tubercle bacillus and in a few results are spectacular.[4] Those which are amenable to x-rays respond well to suberythema or subintensive and fractional dosage. Suberythema doses of from one half to two thirds of a skin unit, repeated in a month or more, give excellent results in scrofuloderma and disseminated miliary lupus. This method of irradiation, alone or combined with various medical and surgical methods, benefits or cures also lupus vulgaris, sarcoid, erythema induratum, tuberculosis orificialis and tuberculosis verrucosa cutis. The tuberculids and lupus erythematosus temporarily involute under x-rays, but recurrences are not prevented.

Aural and ocular tuberculosis are difficult to affect with light, although corneal ulcers and phlyctenular conjunctivitis have not infrequently healed under local exposures. Roentgen therapy has proved effective with tuberculosis of the cornea and iris, but its dose must be moderate and repeated regularly at intervals of about four weeks. These measures are indicated when tuberculin therapy has failed.

RELATIVE MERITS OF DIFFERENT FORMS OF RADIATION

The following outline is constructed with the realization that as yet the relative merits are not accurately defined and not accepted by all. It is offered merely as a possible working basis:

Sunlight is available in almost every locality at some season of the year. Its intensity is variable, but moving air and low intensity sunlight or diffuse daylight can generally be used. In some places, where the extreme cold of winter prevents outdoor exposures for a few months, artificial sources of light should be resorted to.

1. *Uncomplicated Pulmonary Tuberculosis.*—(*a*) Sunlight is to be used only after prolonged trial of routine rest, hygienic-dietetic treatment, and perhaps in cases in which surgical treatment has failed to cause satisfactory healing (exudative tuberculosis always excluded). Carefully graduated general body exposures are to be made to sunlight of low intensity or to diffuse daylight, together with air baths in the earlier morning or later afternoon hours. The so-called pre-

4. MacKee, G. M.: Cutaneous Roentgen and Curie Therapy, Science of Radiology, 1933, p. 291.

tuberculosis of children, as well as chronic pleurisies, are all forms in which sunlight can be the treatment of choice.

(*b*) Artificial lights (mercury arc in quartz and carbon arc) deserve a trial only after routine therapy has failed, but one should not expect promising results except in isolated instances. They may occasionally help as an adjuvant. Progressive cases with fever and exudative tuberculosis are excluded. Pleurisies and the "pretuberculosis" of children can be favorably influenced.

(*c*) X-rays are to be confined to the proliferative and fibrotic forms with little or no fever, and then used rarely, if at all. Progressive pulmonary tuberculosis and all exudative forms strongly contraindicate x-ray exposures.

2. *Active Extrapulmonary Tuberculosis Without Active Pulmonary Tuberculosis.*—Tuberculosis of the skin, lymph nodes, bones, joints, genito-urinary tract, peritoneum, intestine: By this is meant that the signs and symptoms of active or progressive disease are due, not to the pulmonary tuberculosis, but to the extrapulmonary focus. Signs of active disease include both local and constitutional signs.

(*a*) Sunlight is the treatment of choice for bones and joints, lymph nodes and genito-urinary tract, especially in the highlands. Graduated exposures of the body are to be made to sunlight, together with the use of rest and hygiene and whatever surgical and orthopedic measures may be necessary. Results are excellent if sunlight is employed over prolonged periods, even in active but not rapidly progressive forms of the disease. Artificial lights should be used, in addition, on cloudy days, especially in cases of cutaneous tuberculosis or discharging sinuses.

(*b*) Artificial lights (mercury arc in quartz and carbon arc) are to be used usually as substitutes for sunlight. However, they may be preferable to sunlight for certain complications, such as superficial, peritoneal and intestinal tuberculosis. Superficial forms include lupus vulgaris and scrofuloderma, keratitis and phlyctenular conjunctivitis. General exposures are always made with additional local exposures over the area of disease.

(*c*) Roentgen therapy may be the treatment of choice in the infiltrative stage of lymph node tuberculosis. Employed locally with other measures, results are often hastened in tuberculosis of the small bones, superficial joints, and skin. The locally applied x-rays and general sunlight or lamp irradiations can be combined. When x-ray exposures are thus added to light therapy, the duration of treatment is at times shortened.

3. *Active Extrapulmonary Tuberculosis with Active Pulmonary Tuberculosis Accompanied by Fever.*—Both pulmonary and extrapulmonary tuberculosis show subjective and objective evidence of active or progressive disease.

(*a*) Sunlight is the treatment of choice in tuberculosis of the bones and joints and in genito-urinary tuberculosis, sunlight of low intensity in the early morning and late afternoon hours being used. The solar and air exposures should be given very gradually.

(*b*) Artificial lights (mercury arc in quartz and carbon arc): The mercury quartz light is often preferred when pulmonary disease is exudative and febrile, because of its great deficiency in heat rays. Better results are then had in tuberculosis of the intestine, peritoneum, epididymis and lymph nodes. It is advisable to alternate mercury quartz irradiations with exposure to the outside air and diffuse daylight.

(*c*) X-rays should not be applied locally to an exudative or progressive form of tuberculosis. If not progressive, the same conditions exist as for 2 *c*.

With an acute progressive tuberculous laryngitis, light irradiations applied locally are inadvisable until the acuteness has subsided; but, if other measures have failed, light irradiations may be tried as a final treatment, if only for their possible analgesic effect. Combinations of local irradiations of light and general body exposures are always employed, if possible, according to the indications mentioned.

CONCLUSION

Benefits are undoubtedly obtained by patients suffering from tuberculosis of the bones, articulations, peritoneum, intestine, lymph nodes and larynx when the entire body is exposed to carefully graded doses of natural sunlight or to radiation emitted by certain artificial sources of light rays. The beneficial results of such irradiation are due not only to ultraviolet rays. The visible and infra-red rays, as well as the conditions of the atmosphere, play a certain part in the therapeutic effect.

In tuberculosis of the skin, lupus vulgaris alone can be said to respond specifically to light. Scrofuloderma and erythema induratum react favorably at times to general and local exposure, although not as constantly. Lupus erythematosus does not respond to and may be aggravated by light.

In tuberculosis of the bones and articulations, it is generally agreed that suitable, graded exposure to natural sunlight is most effective in aiding the healing accomplished by orthopedic and other measures. Exposure to artificial sources of radiation is valuable here as a second choice.

Pulmonary tuberculosis, per se, is not an indication for light therapy; stationary pleural tuberculosis has often been helped by this measure.

Genito-urinary tuberculosis deserves a trial of such treatment in combination with other measures. Local exposure to ultraviolet rays of circumscribed tuberculous lesions of the urinary bladder has been shown to yield favorable results, but the method requires special applicating devices and, above all, skilful treatment of the bladder lesion.

Ocular tuberculosis and aural tuberculosis respond infrequently to light. Oral tuberculosis is most resistant.

Fistulas are often resistant to such treatment. Postoperative sinuses, in contrast, are most responsive.

Intestinal, peritoneal and lymph node tuberculosis especially indicate light therapy and often are rapidly responsive.

In tuberculosis, overdosage has produced harmful focal reactions. Here light may set up a focal reaction similar to that of tuberculin.

The erythemic reaction is an accurate indicator of skin tolerance. Hence a preliminary exposure of a small area to gage the minimal perceptible erythema will avoid undue burns.

Surgical versus conservative treatment of bone and joint tuberculosis: With any form of tuberculosis, light is to be used merely as an adjuvant and should be combined with all other indicated forms of therapy. The mainstays of treatment still remain, such as rest, proper dietary, and hygienic outdoor life.

With bone and joint tuberculosis, orthopedic measures combined with light still play the major rôle.

Indications for surgical intervention may depend on many factors: economic and social conditions, the age of the patient, the joint involved, their number and the stage and extent of the disease, involvement of other organs such as the lungs and kidneys, and complicating abscesses or sinuses. Joint tuberculosis is still a local manifestation of a constitutional disease. Surgical measures are therefore in turn to be recognized as adjuvant procedures to be followed by prolonged conservative therapy. Intervention by surgical fusion is always to be seriously considered in the presence of advanced joint destruction. Restoration of function may occur in the synovial form of joint tuberculosis, even in the presence of large effusions; but complete functional return of motion in a joint is doubtful when the bony parts have been destroyed to a marked degree.

Roentgen therapy of pulmonary tuberculosis has many restrictions and important contraindications. Its healing effect in certain forms of extrapulmonary tuberculosis has been definitely established, but the limitations must be recognized, dosage carefully regulated, and treatments given only by experts in the field.

470 Park Avenue.

LEPEL ULTRA-SHORT WAVE MACHINE ACCEPTABLE

Manufacturer: Lepel High Frequency Laboratories, Inc., New York.

The manufacturer recommends this machine for medical and surgical diathermy. The unit is of the spark gap type. The wavelength is approximately 9.5 meters, although there is a second resonance point which generates a wavelength a few meters longer. The spark gap and transformer are kept cool by means of an electric fan, which operates while the unit is turned on.

Fig. 1.—Lepel Ultra-Short Wave Machine.

Temperature measurements were taken on a spark gap and the transformer to determine whether they overheated. The temperature rises, after the machine had been operated on a full load for one hour, did not exceed the upper limits adopted by the Council. It is well fitted in a substantial cabinet and appears to be well made. The shipping weight is about 150 pounds.

The tissue heating ability of the unit was investigated in a clinic acceptable to the Council. According to a technic recommended by the manufacturer, cuff electrodes 2.5 cm. wide and 50 cm. long were applied to the human thigh, one near the hip and the other just above the knee. Felt and toweling about 2.5 cm. thick separated the skin from the cuffs.

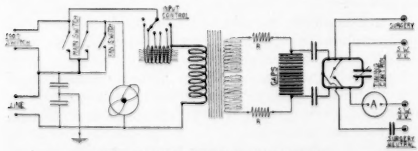

Fig. 2.—Schematic diagram of circuit

Thermocouples were inserted directly into the tissues. All thermometric devices were checked against a standard mercury thermometer. Thermocouples were in place during treatment. After twenty minutes' treatment, the machine being operated at the patient's tolerance, the temperature rise (average of eight tests) was observed to be more than that for conventional diathermy—the criterion for evaluating short wave machines which the Council has adopted.

Burns may be produced by this machine, but, with ordinary care, they may be avoided; their likelihood to occur is much less than with conventional diathermy.

In view of the foregoing report, the Council on Physical Therapy voted to include the Lepel Ultra-Short Wave Machine in its list of accepted apparatus.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary.

DIPHTHERIA ANTITOXIN.—For description see the U. S. Pharmacopeia and Useful Drugs.

Lederle Laboratories, Inc., Pearl River, N. Y.

Diphtheria Antitoxin, Globulin-Lederle-Modified.—This preparation differs from diphtheria antitoxin-U. S. P. chiefly in the method of refinement. The process of refinement is based essentially on a controlled method of selective digestion of the proteins of the immune horse blood with pepsin. As a result of this process, as much as 90 per cent of the coagulable protein may be digested, a smaller portion is precipitated, and the remainder, a pseudoglobulin fraction, is purified first by ordinary filtration and then by ultrafiltration and dialysis. Diphtheria antitoxin, globulin-Lederle-modified, is marketed in single syringe packages representing 1,000, 5,000, 10,000, 20,000 and 40,000 units of diphtheria antitoxin, respectively.

RABIES VACCINE (See New and Nonofficial Remedies, 1935, p. 380).

Lederle Laboratories, Inc., Pearl River, N. Y.

Rabies Vaccine-Lederle (Semple Method.).—(See New and Nonofficial Remedies, 1935, p. 382).—Also marketed in packages of fourteen vials each containing 2 cc.

TETANUS ANTITOXIN.—For description see the U. S. Pharmacopeia and Useful Drugs.

Lederle Laboratories, Inc., Pearl River, N. Y.

Tetanus Antitoxin, Globulin-Lederle-Modified.—This preparation differs from tetanus antitoxin-U. S. P. chiefly in the method of refinement. The process of refinement is based essentially on a controlled method of selective digestion of the proteins of the immune horse blood with pepsin. As a result of this process, as much as 90 per cent of the coagulable protein may be digested, a smaller portion is precipitated, and the remainder, a pseudoglobulin fraction, is purified first by ordinary filtration and then by ultrafiltration and dialysis. Tetanus antitoxin, globulin-Lederle-modified, is marketed in packages of one vial containing 1,500 units of tetanus antitoxin; in single syringe packages representing 1,500, 3,000, 5,000, 10,000, 20,000 and 40,000 units of tetanus antitoxin, respectively; and in packages of one cylinder containing 10,000 units of tetanus antitoxin, for intraspinal administration.

NOVOCAIN (See New and Nonofficial Remedies, 1935, p. 63, and THE JOURNAL, June 22, 1935, p. 2256).

The following dosage forms have been accepted:

Ampules Solution Novocain, 2 per cent, 3 cc.: Novocain 0.06 Gm. in distilled water to make 3 cc.

Ampules Novocain Solution, 10 per cent, 2 cc. (For Spinal Anesthesia): Novocain 0.2 Gm. in distilled water to make 2 cc.

WHITE'S COD LIVER OIL CONCENTRATE (LIQUID) (See THE JOURNAL, Sept. 21, 1935, p. 966).

The following dosage form has been accepted:

White's Cod Liver Oil Concentrate Liquid, Vials, 5. cc.—Each two-thirds minim (0.038 Gm.) has a vitamin A potency of not less than 2,280 units (U. S. P. X Revised, 1934), and a vitamin D potency of not less than 320 units (U. S. P. X Revised, 1934).

MERCUROCHROME (See New and Nonofficial Remedies, 1935, p. 309).

The following dosage form has been accepted:

Surgical Solution of Mercurochrome.—Mercurochrome 2 per cent dissolved in a vehicle consisting of 55 parts of 95 per cent alcohol-U. S. P., 10 parts of acetone-U. S. P., and 35 parts of water, to which has been added sodium carbonate in the proportion of 0.1 per cent.

METAPHEN (See New and Nonofficial Remedies, 1935, p. 314).

The following dosage form has been accepted:

Saf-T-Top Tincture Metaphen: Tincture of metaphen 1: 200, marketed in ampules having a capillary opening, containing 2 cc. and 15 cc.
Prepared by Robert A. Bernhard, Rochester, N. Y.

Committee on Foods

THE COMMITTEE HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS.
RAYMOND HERTWIG, Secretary.

ACCEPTANCE WITHDRAWN

LISTER'S DIETETIC FLOUR (SELF-RISING)

Manufacturer.—Lister Bros., Inc., New York.

Description.—Self-rising mix, containing casein, sodium caseinate, ground ivory or palm nut (Phytelephas macrocarpa), sodium bicarbonate and calcium acid phosphate.

Manufacture.—The casein curd is precipitated from milk with hydrochloric acid. The curd is worked and washed with water at least five times, dried and ground. The sodium caseinate is prepared by adding four parts of sodium bicarbonate to the curd (described above) from 100 pounds of milk. The mass is dried on hot rolls.

Definite proportions of the formula ingredients are automatically mixed and packed in cartons.

Analysis (submitted by manufacturer).—

	per cent
Moisture	7.0
Ash	6.6
Fat (ether extract)	0.05
Protein (N × 6.25)	56.9
Reducing sugars	0.0
Sucrose	0.0
Starch (diastase method)	0.0
Dextrins (alcohol precipitation method)	0.0
Crude fiber	1.0
Carbohydrates other than crude fiber (by difference)	28.5

Calories (available).— 2.3 per gram; 65 per ounce.

Claims of Manufacturer.—Recommended for diets low in carbohydrates.

Uselessness as a Special Purpose Food.—Lister's Dietetic Flour, manufactured specially for use in diets restricted in dextrose formers, was accepted in November 1933, before the Committee adopted definite requirements for a special purpose flour of this character. To be eligible for acceptance at this time, such type of flour shall contain dextrose formers yielding dextrose in an amount not greater than 3.3 Gm. per hundred cubic centimeters (the dextrose equivalence being computed as the carbohydrate, plus 58 per cent of the protein, plus 10 per cent of the fat content of the food). Dextrose formers of Lister's Dietetic Flour, on the other hand, yield 13 Gm. of dextrose per hundred cubic centimeters (based on submitted information that 100 cc. of the product weighs 39 Gm.).

There is authoritative evidence that commercially prepared special diabetic foods such as this flour are of limited usefulness to the diabetic patient and that the availability of insulin makes them no longer necessary. Artificial substitutes for ordinary foods are not to be favored; it is much better for the diabetic patient to learn how to plan his diet with foods in common use and readily available. The diet should be exactly prescribed in carbohydrate, protein and fat, and total calories.

The designation of a food as a "diabetic food" merely because it is low in carbohydrates is now unwarranted and misleading and gives the erroneous impression either that the food taken in unrestricted quantities in diabetes is harmless or that it has remedial action. Except for the necessity of restricting foods to avoid overstepping the food tolerance, there are no special diabetic nutritional requirements. The exploitation of starch-free or low carbohydrate foods containing an excess of protein for use by diabetic patients is unwarranted. Protein may be tolerated almost as poorly, if not quite as poorly, as starch in diabetes.

Because Lister's Dietetic Flour is adjudged without usefulness or special adaptability for inclusion in diets restricted in dextrose formers, it no longer will be listed among the accepted foods of the Committee on Foods.

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION, AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.
RAYMOND HERTWIG, Secretary.

RUGER'S PURINA BRAND WHEAT BREAD

Manufacturer.—John B. Ruger Sons Company, La Fayette, Ind.

Description.—A whole wheat and white flour bread made by the sponge dough method (method described in THE JOURNAL, March 5, 1932, p. 817); prepared from whole wheat flour, water, white flour, sweetened condensed skim milk, leaf lard, yeast, salt, sugar, partially defatted soy bean flour (omitted in summer) and a yeast food containing calcium sulphate, ammonium chloride, sodium chloride and potassium bromate.

HIDEX

Manufacturer.—Scientific Sugars Company, Indianapolis, subsidiary of Union Starch & Refining Company.

Description.—Essentially a powdered mixture of dextrins (64 per cent) and maltose (32 per cent), obtained from diastatic conversion of corn starch.

Manufacture.—A mixture of formula proportions of ground corn (hulls and germ removed), water and diastatic barley malt is held at the proper temperature until the starch is converted into dextrins and maltose in the ratio of approximately 64 to 32 respectively. The resulting mash is filtered; the filtrate is heated to 85 C., admixed with charcoal, filtered, concentrated in vacuum, heated to 95 C., drum-dried in vacuum, ground and packaged.

Analysis.—

	per cent
Moisture	3.0
Total solids	97.0
Ash	0.5
Fat (ether extract)	0.0
Protein (N × 6.25)	0.5
Reducing sugars as maltose	32.0
Crude fiber	0.0
Dextrins (by difference)	64.0

Calories.— 3.9 per gram; 111 per ounce.

Claims of Manufacturer.—A high dextrin carbohydrate food for supplementing milk in infant feeding. Of especial advantage in diarrhea and postoperative feeding in that the dextrins do not readily ferment. Relatively slowly digested, the dextrose produced is only gradually made available for absorption.

JENNY LEE BRAND LONG MACARONI
JENNY LEE BRAND LONG SPAGHETTI
JENNY LEE BRAND ELBOW MACARONI
JENNY LEE BRAND ELBOW SPAGHETTI
JENNY LEE BRAND MACARONI SHELLS

Manufacturer.—Minnesota Macaroni Company, St. Paul.

Description.—Macaroni of various shapes prepared from durum semolina.

Manufacture.—Same as for Minnesota Brand macaroni products (THE JOURNAL, Aug. 3, 1935, p. 369).

GRISDALE BRAND TOMATO JUICE

Distributor.—Gristede Bros., Inc., New York.

Manufacturer.—P. J. Ritter Company, Philadelphia.

Description.—Canned tomato juice, retaining in high degree the natural minerals and vitamins. Seasoned with salt. The same as Ritter Tomato Juice (THE JOURNAL, Oct. 6, 1934, p. 1069).

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, NOVEMBER 16, 1935

CLINICAL ASPECTS OF AVITAMINOSIS A

The relatively recent and eagerly awaited development of knowledge of the chemistry of vitamins has been preceded and paralleled by the compilation of information concerning the physiologic importance of the substances so designated. It is now evident that a number of descriptions of disease appearing in the early medical literature are largely manifestations of avitaminosis. Fundamental discoveries in the organic chemical, the physiologic chemical and the physiology laboratories have explained in many instances the rationale of certain historic dietary therapeutic measures. Although the major portion of the biologic results have been obtained with experimental animals, this information has gradually led to a recognition of conditions in the clinic which simulate those produced in the laboratory.

The fat-soluble factor, vitamin A, has not yet been isolated in pure form but has interested clinicians since early times through the manifestations of its deficiency. Accumulating medical literature testifies to the manifold functions in which this vitamin is involved. Avitaminosis A has been described as the cause of xerophthalmia, as an alleged etiologic factor in the formation of urinary calculi, as being of significance in creating a resistance to infections in the respiratory organs, as related to keratomalacia and other pathologic lesions of the cutaneous system, and as a necessary dietary constituent for prevention of lesions of the nervous system. The skin changes of chronic avitaminosis A are particularly striking; many varieties of dermatitis may be seen before xerophthalmia makes its appearance. Mackay [1] recently made a critical review of the clinical literature and concluded that the earliest effects of vitamin A deficiency could probably be detected in the skin. This author undertook a large scale test on infants to determine the effects of prophylactic treatment with vitamin A. The results [2] taken as a whole indicate a perceptible increase in the resistance to minor infections of the skin in those infants given the extra vitamin A. Mackay concludes that, although only a fraction of the minor skin infections seen in the infants studied by her could be attributed solely to a lack of vitamin A, there is in avitaminosis A a generally lowered resistance in these cases. She believes that infants fed on dried milk should have their dietary supplemented with vitamin A as a routine measure.

The relationship of keratomalacia to vitamin A deficiency was demonstrated conclusively by Bloch,[3] who was one of the first to stress the fact that the disease is characterized by general manifestations of which the ocular symptoms are only a part. Despite the fact that a considerable amount of literature has appeared on this aspect of avitaminosis A, the reports have dealt primarily with experimental problems and with reports of ophthalmologists. Clinical and pathologic studies have been few and there has been little effort to correlate the general symptomatology and the pathology. A good beginning toward satisfying the need for this type of data has been made in the excellent clinical and anatomic study of avitaminosis A among the Chinese [4] reported from Peiping Union Medical College. The investigators have studied the records of 203 patients suffering from various manifestations of avitaminosis A and the material obtained from seventeen necropsies and twenty-two biopsies. The results are discussed from the points of view of etiology, pathology, symptomatology, physical examination and diagnosis, and an attempt is made to correlate the clinical and pathologic pictures. Sweet and K'ang find that diet is, of course, the factor of prime importance in the causation of the deficiency disease of keratomalacia. Other factors are related to incomplete utilization of the ingested vitamin sources. The pathologic studies are of particular interest because there have been few thorough investigations of the pathology of avitaminosis A in man. In the necropsies performed by Sweet and K'ang, lesions of the eye were most frequent; changes in the respiratory tract ranked next in frequency. The pathologic appearances are described in good detail, as are the symptomatology and the observations in the physical examinations. The authors also present the diagnosis and treatment of the cases under their observation and finally offer cogent comment designed to correlate the results. Case histories of the seventeen patients who provided the material for the necropsies add to the value of their contribution. This most complete investigation offers a model for further reports, wherever possible, of this type

1. Mackay, Helen M. M.: Vitamin A Deficiency in Children, Arch. Dis. Childhood **9**: 65 (April) 1934.
2. Mackay, Helen M. M.: Vitamin A Deficiency in Children, Arch. Dis. Childhood **9**: 133 (June) 1934.
3. Bloch, C. E.: Clinical Investigation of Xerophthalmia and Dystrophy in Infants and Young Children, J. Hygiene **19**: 283 (Jan.) 1921; Blindness and Other Diseases in Children Arising from Deficient Nutrition (Lack of Fat-Soluble A Factor), Am. J. Dis. Child. **27**: 139 (Feb.) 1924.
4. Sweet, L. K., and K'ang, H. J.: Clinical and Anatomic Study of Avitaminosis A Among the Chinese, Am. J. Dis. Child. **50**: 699 (Sept.) 1935.

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and should serve as a stimulus for obtaining additional information in the clinic of some of the more practical aspects of the disease condition resulting from lack of vitamin A.

VITAMIN C AND INFECTION

Few more cogent examples of the justification for the painstaking and deliberate methods of scientific research have developed than is shown in the story of cevitamic acid (vitamin C). Once the evidence had been obtained that a deficiency in this food factor could be produced at will in experimental animals, great effort was made to find sources of it in nature. Concentrates were made from the richest of these and, when they had been sufficiently purified, the chemical constitution was at length established. The goal of this study was reached in 1933, when the synthesis of cevitamic acid was achieved. Thus, in the interval of a quarter of a century from the recognition of experimental scurvy, the factor the absence of which is responsible for the development of this disease was artificially prepared in the laboratory. Perhaps the story is the more thrilling because of the long history of the tacit recognition of human scurvy as a deficiency disorder. However, current events are demonstrating the value of a chemically pure food essential in medicine and the possibility of using such a substance in explaining certain biochemical phenomena.

Cevitamic acid is readily obtainable as pure white crystals, soluble in water and with a somewhat acid taste. Its value as a preventive and cure of human and experimental scurvy has been demonstrated repeatedly. Studies on scorbutic guinea-pigs have shown that the typical defects in bones and teeth caused by the disease are repaired by cevitamic acid just as they are when orange juice is administered.[1] One of the earliest signs of experimental scurvy is an increased clotting time of the blood, decrease in platelets and erythrocytes and a subnormal concentration of pigment.[2] It has been reported that after the administration of 150 mg. of cevitamic acid in acute essential thrombopenia the bleeding ceased and there was an increase in thrombocytes.[3] Cevitamic acid can be determined chemically; the time required for an assay for vitamin C has thereby been greatly shortened. As this substance can be detected and measured in tissues, its distribution and function can be followed with reasonable accuracy.

Jungblut and Zwemer[4] have recently reported that diphtheria toxin is inactivated by vitamin C in vitro. Furthermore, cevitamic acid seems to be able to protect guinea-pigs against the fatal outcome of diphtheria intoxication. Animals given liberal amounts of cevitamic acid were much less sensitive to small doses of the toxin as measured by the intracutaneous test. Similar studies of King and Menten[5] have demonstrated the marked influence of vitamin C in promoting the resistance of guinea-pigs to diphtheria toxin. In their investigation, in which growth was one of the criteria used, it was shown that animals receiving a restricted amount of cevitamic acid, yet enough to prevent any outward signs of scurvy, nevertheless were unable to resist the effects of the toxin as were those fortified with a greater dose of vitamin C. These conclusions seem to indicate that cevitamic acid bears a relation to immunologic reactions. This may be associated with its chemical reaction with the toxin or with an effect on the resistance of the host organism, perhaps motivated through the chemical state of the tissues.

The apparent association of cevitamic acid with resistance to infection is in a way paradoxical. The conception of a foreign agent (bacteria) as the cause of disease was so firmly established through the work of Pasteur, Koch and others that the idea of a deficiency of a dietary essential as an etiologic factor did not receive serious attention until the beginning of the present century. The recent studies emphasize that these two factors may be closely allied in the struggle for maintenance of physiologic well being.

1. Menkin, Valy; Wolbach, S. B., and Menkin, M. F.: Am. J. Path. **10**: 569 (Sept.), 1934.
2. Presnell, A. K.: J. Nutrition **8**: 69 (July) 1934.
3. Böger, A., and Schröder, H.: München. med. Wchnschr. **81**: 1335 (Aug. 31) 1934.
4. Jungblut, C. W., and Zwemer, R. L.: Proc. Soc. Exper. Biol. & Med. **32**: 1229 (May) 1935.
5. King, C. G., and Menten, M. L.: J. Nutrition **10**: 129 (Aug.) 1935.

Current Comment

DEATH OF OVUM AND PREGNANCY TEST

The value of the biologic tests for pregnancy in determining intra-uterine viability is not yet established. In an attempt to solve this question Bishop[1] has summarized the results given by the test in a series of cases in which the date of fetal death could be determined clinically with some degree of certainty. The Friedman test was employed in the eleven cases of the series. In two instances the test was still positive six weeks after the death of the fetus. With these exceptions the test tends to become negative between ten and twenty-four days after intra-uterine death has taken place. The Aschheim-Zondek test, according to other reports, tends to remain positive even longer. The reason for this apparently lies in the greater sensitivity of infantile mice to pregnancy urine than that of adult rabbits. Evidence exists that the Aschheim-Zondek and Friedman tests depend primarily on the presence or absence of functional chorionic tissue rather than on the life or death of the ovum. Since, however, the main function of the placenta is to provide a means of nourishing the living embryo, it might be expected to become inactive on the death of that embryo. Practically, however, it is clear that there is no direct relation between the death of the ovum and the disappearance of gonadotropic substance from the urine.

1. Bishop, P. M. F.: The "Pregnancy" Test in Relation to Death of the Ovum, Lancet **2**: 364 (Aug. 17) 1935.

Furthermore, the time after death of the ovum at which the placenta ceases to elaborate the gonadotropic hormone seems to vary considerably in individual cases and to be determined by no mechanism so far understood. The cases here investigated throw no fresh light on these factors.

IMPROVED BUILDING FOR AMERICAN MEDICAL ASSOCIATION

As was noted in the minutes of the Board of Trustees, published recently in THE JOURNAL, visitors to Chicago will see next year a striking improvement in the headquarters office of the American Medical Association. The changes contemplated include the addition of two stories and a roof assembly hall as additional structure, a refinishing of the exterior of the building in limestone, and many other improvements in the arrangement and equipment of the various bureaus and headquarters offices. The changes are made necessary by the vast increase in the amount of work carried on by the headquarters office in recent years and with a view to still further demands in the future. The Association is now publishing many special periodicals in addition to THE JOURNAL, *Hygeia* and the *Quarterly Cumulative Index Medicus;* applications from additional specialties await opportunity to take over periodicals in these fields. The increasing demands on the councils that investigate and classify drugs, foods, educational activities, laboratories and other medical materials and functions are finding greater demands made on them every year. The Bureau of Legal Medicine and Medical Legislation finds its work greatly increased, and the growth of the Association indicates considerable expansion necessary in the Secretary's office. Moreover, the Bureau of Health and Public Instruction and the Bureau of Medical Economics have multiplied their work from three to five times in the last two years. These facts prompted the Board of Trustees to undertake the improvements that have been mentioned. Again and again the question was raised as to whether or not the Association ought to buy additional land and arrange for building a new structure at some other site or on the same site. In view of the exigencies of the present economic situation and the nature of the organization of the Association, the Board of Trustees considered it far more advisable to make a contract for immediate improvements in the present building. It is hoped that visitors to Chicago in the future will avail themselves of the opportunity to observe the improved headquarters office in action.

Proposed reconstruction of headquarters office.

BOONDOGGLING WITH A HEALTH SURVEY IN NEW YORK

Among the peculiar projects proposed by the WPA in New York State is one that has aroused the wrath and ridicule of a good many people. It was proposed to survey the deaf children in the county of Monroe at an estimated cost of $10,440, Monroe County to pay $1,390. In opposition to the survey, the Subcommittee on Deafness and Hard of Hearing of the Public Health Committee of the Medical Society of the County of Monroe offers the statement that it is impossible to detect deaf children before the age of 3 years. The public and special schools take these children over at 5 years of age. Therefore, the whole project is limited to children between the ages of 3 and 5 years. There is good evidence that the county of Monroe contains sixty of these children. Evidence from the head of the bureau for handicapped children in the New York State Education Department at Albany accounts for only fourteen such children, exclusive of those already cared for. Hence it is proposed to spend $10,440 to survey fourteen children.[1] Furthermore, the survey proposes subsequent training of the deaf child but the project makes no provision for such training. If ever a project was developed to which the word boondoggling could be quite certainly applied, this project qualifies.

PLACARDING INFECTIOUS DISEASES

The commissioner of health of the village of White Fish Bay, Wis., Edwin B. Gute, has designed an interesting new type of placard for the infectious diseases. For such infectious conditions as mumps, German measles, chickenpox, whooping cough and measles, placards have been developed which include not only a sign to be placed on the front and back doors of the house but also a card to be hung in the home containing information and advice to the members of the family on each of the conditions concerned. The cards describe not only the early signs and symptoms, the incubation period and the period of communicability but also the regulations regarding attendance at school

1. Boondoggling editorial, New York State J. Med. **35**:1106 (Nov. 1) 1935.

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and the conduct of the family during the period of illness. In addition, the card includes care of the sick-room, disinfection, and general information to the parents concerning the disease. The placard, which was recently exhibited at the meeting of the American Public Health Association, has attracted wide general attention and is likely to be adopted in other parts of the country.

Association News

RADIO BROADCASTS

The American Medical Association broadcasts over the Blue network and certain additional stations of the National Broadcasting Company at 5 p. m. eastern standard time (4 o'clock central standard time, 3 o'clock mountain time, 2 o'clock Pacific time) each Tuesday, presenting a dramatized program with incidental music under the general theme of "Medical Emergencies and How They Are Met." The title of the program is "Your Health." The program is recognizable by a musical salutation through which the voice of the announcer offers a toast: "Ladies and gentlemen, your health!" The theme of the program is repeated each week in the opening announcement, which informs the listener that the same medical knowledge and the same doctors that are mobilized for the meeting of grave medical emergencies are available in every community, day and night, for the promotion of the health of the people. Each program will include a brief talk dealing with the central theme of the individual broadcast.

The next three programs are as follows:

November 19. Infection, Morris Fishbein, M.D.
November 26. Common Household Emergencies, W. W. Bauer, M.D.
December 3. Tuberculosis, Morris Fishbein, M.D.

This program is broadcast also on the short waves through KDKA, Pittsburgh, over station W8XK, 11,870 and 12,210 kilocycles.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

Another Full Time Health Unit.—The establishment of the Henry County Health Department on a full time basis brings the total number of these full time units in the state to fifty-six. The new unit will begin functioning January 1. An effort is being made to place all county health departments on a full time basis.

Regional Headquarters for National Health Survey.—Willis C. Beasley, A.M., formerly instructor in psychology, Johns Hopkins University, Baltimore, is in Alabama establishing headquarters for four states now being studied in the national survey of health conducted by the U. S. Public Health Service. Montgomery has been designated regional headquarters for Alabama, Georgia, Louisiana and Texas. In Alabama the study will be carried on at Montgomery, Birmingham, Anniston, Eufaula and Greenville.

CALIFORNIA

Examiners Reelect Officers.—At a meeting of the state board of medical examiners in Sacramento, October 21, Dr. William R. Molony Sr., Los Angeles, was reelected president, Dr. Clark L. Abbott, Oakland, vice president, and Dr. Charles B. Pinkham, San Francisco, secretary.

Semiannual Medical Meeting.—The Southern California Medical Association will hold its ninety-third semiannual meeting at the Los Angeles County Medical Building, November 29-30. Guest speakers will be Drs. Edwin E. Osgood, assistant professor of biochemistry and medicine, University of Oregon Medical School, and George Gill Richards, Salt Lake City, Utah. Other speakers will include:

Dr. Harold L. Thompson, Los Angeles, Perforated Peptic Ulcer.
Dr. Joseph Salem Rubin, Los Angeles, Bilateral Spermatocele with Report.
Dr. Wilbur P. Bailey, Los Angeles, Usual and Unusual Manifestations of Hodgkin's Disease.
Dr. John Luther Maroon, Santa Ana, Subacute Bacterial Endocarditis.
Dr. Edward C. Pallette, Los Angeles, Portal Thrombosis.
Dr. Milo K. Tedstrom, Santa Ana, Spontaneous Hypoglycemia, with Especial Reference to Cardiac Symptoms.

Society News.—Dr. Neil Hamilton Fairley, secretary, Royal Society of Tropical Medicine and Hygiene, London, addressed the San Francisco County Medical Society, November 13, on "Present-Day Ideas of Blackwater Fever in Relation to Malaria." A discussion of the Ceylon malaria epidemic was included. Speakers before the society, November 12, included Drs. Fred H. Kruse on "Medical Aspects of Esophageal Disorders"; Thomas F. Mullen, "Surgical Treatment of Benign Stricture of the Esophagus," and Montague S. Woolf, "Benign Fibrous Stricture of the Rectum (Lymphogranuloma Inguinale)." Dr. Ben L. Bryant, Cincinnati, among others, will address the section on eye, ear, nose and throat, November 26, on "Hypothyroidism in the Practice of Otorhinolaryngology."

University News.—The Northern California Alumni Association of the College of Medical Evangelists was addressed at its semiannual meeting in San Francisco, October 27, by Drs. George V. Kulchar on "Clinical Management of Syphilis"; George D. Barnett, "Cardiac Problems as seen by the General Practitioner"; Leroy C. Abbott, "Skeletal Traction in Fractures of the Long Bones, and Especially of the Shaft of the Femur," and Edmund W. Butler, "Diagnosis of the Acutely Shocked Patient."——The annual Alumni Day of the University of California School of Medicine, San Francisco, will be observed, November 22. The day will be devoted to the reading of papers, clinics and conferences. Dr. John C. Ruddock, Los Angeles, class of 1916, will deliver the annual Alpha Omega Alpha lecture in the late afternoon.

DISTRICT OF COLUMBIA

University News.—Major Gen. Charles R. Reynolds, surgeon general, U. S. Army, gave the first lecture in the Smith-Reed-Russell series at George Washington University School of Medicine, October 24; the title of his address was "The Medical Corps of the United States Army."

Tuberculosis Campaign with WPA Funds.—With $99,000 available from the Works Progress Administration, a campaign to eradicate tuberculosis in the District of Columbia will begin, November 25. X-ray machines will be placed at strategic positions in the city to take roentgenograms by means of the paper method. Physicians may refer patients either for an initial film or for a check on a patient under treatment. All the work will be done without cost to the patient. A special effort will be made to investigate persons in homes where recognized cases exist. The Medical Society of the District of Columbia is cooperating in the drive.

Society News.—Dr. Claude S. Beck, associate professor of medicine, Western Reserve University School of Medicine, Cleveland, will address a joint meeting of the Medical Society of the District of Columbia and the Washington Heart Association, November 20, on "The Heart as a Surgical Organ."——Dr. Grace G. Purse, Washington, discussed pernicious anemia before the Women's Medical Society of the District of Columbia, November 5.——Dr. Walter Timme, New York discussed "Status Hypoplasticus, with Its Involvement of the Internal Glandular Mechanisms" before the naval medical officers of the District of Columbia at their first regular monthly meeting, October 7. Dr. Oswald S. Lowsley, New York, discussed "New and Improved Developments in Urologic Surgery" at the meeting, November 4.

ILLINOIS

Personal.—Dr. Maskel Lee, Atlanta, observed his eightieth birthday with a dinner, October 17.——Dr. Walter H. Baer has been appointed managing officer of the Peoria State Hospital.

Meeting of Bacteriologists.—The first annual meeting of the Society of Illinois Bacteriologists was held at the Chicago Woman's Club, Chicago, November 1. Fred W. Tanner, Ph.D., Urbana, president of the society, opened the meeting. Dr. Alexander A. Day, chairman, department of bacteriology, Northwestern University Medical School, Chicago, spoke on "Trends of Medical Bacteriology"; A. L. Whiting, Urbana, "High Points of Agricultural Bacteriology," and Winford Lee Lewis, Ph.D., director, scientific research, Institute of American Meat Packers, Chicago, "What Bacteriology Means to Industry." The society was organized May 8.

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Chicago

Physicians Invited to History Lectures.—Physicians are cordially invited to attend a course of lectures on the history of medicine at the University of Illinois College of Medicine. Dr. Morris Fishbein, editor of THE JOURNAL, is lecturing every Monday through the semester from 5 to 6 o'clock.

Hospital News.—Construction has begun on a new $75,000 two story addition to Michael Reese Hospital. The first floor and basement of the new building will be occupied by a medical library, given by Louis Florsheim in memory of his wife, Lillian. The Samuel Deutsch Human Convalescent Serum Center will be on the second floor. The center prepares human serum mainly for infantile paralysis, scarlet fever and measles.

University News.—Dr. Charles W. Hughes, assistant in anatomy at Loyola University School of Medicine, has been appointed associate professor of anatomy, succeeding Dr. Simon B. Chandler. Forty-nine students in the school of medicine were awarded certificates of membership in honorary seminars, October 14. Membership in the seminars is restricted to students of high scholastic standing who are in a position to handle difficult diagnosis, technic and treatment of cases presented for discussion at seminar meetings. Of ten clinics now operating in the Loyola University Dispensary, the allergy clinic is the most frequented, it is reported.

INDIANA

Society News.—Dr. Homer H. Wheeler will discuss diseases of the anorectal region before the Indianapolis Medical Society, November 19; Dr. Julius H. P. Gauss, jaundice, its significance and implication, and Dr. Walter Stoeffler, intussusception. The society held a joint meeting with the Seventh District Medical Society, November 12, at which Dr. Paul D. White, Boston, discussed various phases of heart disease. Dr. George J. Garceau talked on backache before the Indianapolis Medical Society, November 5.

Personal.—Dr. Dunn Hamilton Row, Indianapolis, sailed, November 1, for Shikarpur, Baluchistan, India, where, with four other eye specialists, he will conduct an eye clinic.—— Dr. James E. McMeel, South Bend, has been made medical supervisor and director of Notre Dame University, succeeding the late Dr. Francis J. Powers.——Dr. Charles E. Holland has been appointed health officer of Bloomington, succeeding Dr. Russell A. De Motte.——Dr. Holger M. Andersen, formerly on the staff of the Epworth Hospital, South Bend, has been appointed to the medical staff of Culver Military Academy, Culver.

IOWA

Personal.—Dr. Fred H. Howard, Strawberry Point, was guest of honor at a banquet, October 14, in celebration of his completion of fifty years' practice in the community.—— Dr. Charles F. Schilling, Takoma Park, Md., has been appointed medical director of Iowa Sanatorium and Hospital, Nevada, succeeding the late Dr. John F. Morse.

Society News.—A symposium on unusual goiter problems was presented before the Des Moines Academy of Medicine and Polk County Medical Society, November 12, by Drs. Ben F. Kilgore, John B. Synhorst and Harry A. Collins. A symposium on appendicitis was presented at the meeting, October 29, by Drs. Bernard C. Barnes, Earl D. McClean, Harold N. Anderson and William E. Sanders.

KENTUCKY

Society News.—At a meeting of the Northeastern Kentucky Medical Association in Paintsville, October 17, speakers were Drs. Ray M. Bobbitt, Huntington, W. Va., on "Management of Infections of the Urinary Tract"; Samuel C. Smith, Ashland, "Why We Should Belong to and Attend Medical Organizations"; Samuel Overstreet, Louisville, "Significance and Treatment of Upper Abdominal Pain"; Albert L. Bass, Louisville, "Ciliary Action of Respiratory Epithelium," and Philip F. Barbour, Louisville, "Anorexia of Children, Cause and Treatment."—— A symposium on poliomyelitis was presented at a meeting of the Jefferson County Medical Society, Louisville, November 4, by Drs. Hugh R. Leavell, Aura J. Miller, William W. Nicholson and Richard T. Hudson. In a symposium on anemia, November 18, speakers will be Drs. William H. Allen, Arthur T. Hurst and Edward C. Humphrey. ——Dr. Aura Jones Miller addressed the Louisville Medico-Chirurgical Society, November 8, on "Present-Day Problems in Typhoid Fever."——Dr. Owsley Grant addressed the Louisville Surgical Society, November 1, on "Infectious Surgical Conditions of the Kidney."——Dr. Frank A. Simon presented a paper on "Hypersensitiveness to Pituitary Extracts" and Dr. Arthur T. Hurst on "Treatment of Anemia" at a meeting of the Transylvania Medical Society, Louisville, November 7.

MAINE

Society News.—The Washington County Medical Society was addressed in Calais recently by Drs. Reginald L. Cameron, Eastport, on health problems in Washington County, and Norman E. Cobb, Calais, "Craniorachischisis Type of Fetal Monstrosities."

MARYLAND

Society News.—At a meeting of the Society of Hygiene of Johns Hopkins University, October 23, in Baltimore, speakers were Janet H. Clark, Ph.D., on "Effect of Ultraviolet Radiation on Lens Protein and the Relation of Radiation to Industrial and Senile Cataract," and Raymond Pearl, LL.D., "Incidence of Tuberculosis Among the Offspring of Tuberculous Parents."

Attendance of Midwives at Births Decline.—Of 27,317 births recorded in Maryland in 1934, 90 per cent were attended by physicians and 10 per cent by midwives. According to the state department of health, the records of the bureau of vital statistics show a decline in the attendance of midwives at births since 1916, when the state was admitted to the birth registration area. In Baltimore the attendance of physicians at white births increased from 67.3 per cent of the total in 1916 to 95.1 per cent in 1934; the attendance of physicians at Negro births increased from 76.2 per cent of the total in 1916 to 92.9 per cent in 1934. There were 2,617 physicians practicing in the state in 1934, 872 in the counties and 1,745 in Baltimore. There were 313 midwives, 244 in the counties and sixty-nine in Baltimore.

MASSACHUSETTS

Clinical Lectures.—Dr. Siegfried Thannhauser, formerly director of the medical clinic and professor of internal medicine at the University of Freiburg in Bremen and now associate professor of medicine at Tufts College Medical School, Boston, opened a series of clinical lectures at the Boston Dispensary, November 2, with a talk on diabetes. November 9 he also spoke on diabetes. He is giving a lecture on liver disease, November 16, and on November 23 will discuss peptic ulcer.

Dr. Houssay Gives Dunham Lectures.—Dr. Bernardo A. Houssay, professor of physiology and director of the Institute of Physiology, University of Buenos Aires, will deliver three lectures under the Edward K. Dunham Lectureship for the Promotion of the Medical Sciences, on "Recent Studies on the Functions of the Hypophysis." The lectures will be given at the Harvard Medical School, November 22, on "What We Have Learned from the Toad Concerning Hypophyseal Functions"; November 25, "Metabolic Functions of the Hypophysis," and November 27, "The Hypophysis and Diabetes." The lectureship was founded in 1923 in honor of Dr. Dunham, who graduated from Harvard in 1886; it is given annually.

MICHIGAN

Commission on Medical Economics.—The Medical Economics Commission of the Wayne County Medical Society was recently formed to initiate and coordinate studies and investigations in the field of medical economics and recommend policies of medical, hospital and public health practice and medicocivic relations to the council of the society. The former committees on public health, medicocivic relations, industrial relations and unauthorized practice of medicine have been merged into the medical economics commission as four of its six sections. The section on lay cooperation will study any encroachment of lay workers in the professional field, the work of school nurses and laboratory technicians; plans of sickness insurance will be investigated and a program of public information to secure lay cooperation will be developed. The section on public health relations will study and develop cooperation with health departments and with the officials of the Emergency Relief and Works Progress Administrations in providing medical service to relief clients. It will aid the local medical school in any necessary modification of its curriculum. The section on coordination of medical services will study hospital and dispensary economics and reported abuses, medical representation on hospital boards, hospital staff cooperation, relations between hospitals and physicians, social service departments including intake policy, pay clinics and diagnostic clinics and nurse anesthetists. Counter prescribing and other drug store abuses will be studied by the section on coordination of pharmaceutic service. It will also recommend ways of cooperation with ethical pharmacists. The section on legislation in relation to medical economics will study bills and proposals for presentation to the Michigan legislature and to Congress to aid the physician. The work of the section on industrial relations will deal with workmen's compensation, contract prac-

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tice, the activities of insurance companies and industrial plants in the medical field and the relation of industry in general to the physician. Dr. Frank W. Stafford is chairman of the new commission.

MINNESOTA

Dr. Cottam Named Director of Health of Minneapolis.—Dr. Gilbert G. Cottam was recently appointed to the newly created position of director of health and hospitals for Minneapolis. The new position has jurisdiction over the Minneapolis General Hospital and the city health department, it was stated. Dr. Cottam was graduated from Marion-Sims Medical College, St. Louis, in 1893.

University Courses.—A night course in preventive medicine was opened, October 3, by the extension division of the University of Minnesota, Minneapolis. It will continue for seventeen weeks under the direction of Dr. Harold S. Diehl, dean of medical sciences. A course in tuberculosis and other diseases of the chest by Dr. Jay Arthur Myers is given the same evening following the course in preventive medicine.

Society News.—Dr. Frederick H. K. Schaaf, Minneapolis, among others, addressed the Renville County Medical Society in Olivia, recently, on "Advances in Therapeutics."——The St. Paul Surgical Society has been organized with Drs. Harry B. Zimmermann as president, Elmer M. Jones, vice president, and Nathaniel L. Leven, secretary.——At a meeting of the Minnesota Academy of Medicine in Minneapolis, November 13, theses were presented by Drs. Robert G. Allison, Minneapolis, and Lyle C. Bacon, St. Paul, entitled "Radiation Therapy" and "Schlatter's Disease," respectively.

MISSOURI

Personal.—Dr. John R. Bruce, Marshfield, has been appointed health commissioner of Webster County; he formerly served as county physician.——Dr. Charles W. Burrill observed his ninetieth birthday at his home in Kansas City, October 20. Dr. Burrill graduated from Northwestern University Medical School in 1872 and has been a member of the Jackson County Medical Society since 1883.

NEW HAMPSHIRE

Dr. Bielschowsky at Dartmouth.—Dr. Alfred A. Bielschowsky, formerly professor of ophthalmology at the University of Breslau, Germany, who spent six months last year at Dartmouth Medical School, Hanover, doing special research in physiologic optics, has now joined the faculty as visiting lecturer in ophthalmology, *Science* reports. Dr. Bielschowsky was at the University of Breslau for about ten years and had previously been on the faculties of the Universities of Marburg and Leipzig.

NEW YORK

Society News.—Dr. Pol N. Coryllos, New York, addressed the Broome County Medical Society, Binghamton, November 5, on empyema.——Dr. Bret Ratner, New York, addressed the Schenectady County Medical Society, Schenectady, November 5, on "The Problem of Allergy in Childhood."——Dr. Jane Sands Robb addressed the Onondaga Medical Society, Syracuse, November 5, on "Studies of the Physiology of Cardiac Conduction." Drs. William A. Groat and Tyree C. Wyatt reported a case of acute basophilic leukemia.

Dr. Pinner Appointed Pathologist.—Dr. Max Pinner, Tucson, Ariz., has been appointed principal diagnostic pathologist for the state tuberculosis hospitals of New York, with headquarters at the Biggs Memorial Hospital, Ithaca. Dr. Pinner received his medical education at the Universities of Tübingen and Berlin, Germany. Before going to Tucson, he was engaged in research at the Municipal Tuberculosis Sanitarium in Chicago and later was director of laboratories at the Maybury Sanatorium, Northville, Mich., and pathologist at the Herman Kiefer Hospital, Detroit.

Study of Maternal Mortality.—The Medical Society of the County of Erie is making a study, through its maternal mortality survey committee, of maternal deaths. From January 1 to June 1, thirty-two deaths were studied with special reference to the preventability of the death and where the responsibility lay. Supplemental obstetric information is obtained from special sheets sent out with birth certificates from the Buffalo health department; from this information a study will be made of types of delivery. Obstetric nursing is also being considered in the survey and a program of public educational work is being carried on in cooperation with the local child health week committee. The survey committee asks the cooperation of physicians, families and medical examiners in obtaining necropsies on every maternal death.

New York City

Brickner Lecture.—Dr. David Marine will deliver the fifth Walter M. Brickner Lecture of the Hospital for Joint Diseases, November 21, at the hospital. Dr. Marine's subject will be "Some Practical Aspects of Thyroid Physiology."

Second Harvey Lecture.—Robert M. Yerkes, Sc.D., professor of psychobiology, Yale University School of Medicine, New Haven, will deliver the second Harvey Lecture of the winter at the New York Academy of Medicine, November 21. The title of the lecture will be: "The Significance of Chimpanzee-Culture for Biological Research."

Personal.—Dr. Thomas A. Martin, medical director of Harlem Hospital, has been made director of medical services at Saint Vincent's Hospital.——Dr. August W. F. Westhoff has been appointed chief of the medical staff of Wyckoff Heights Hospital. Members of the staff entertained Dr. Westhoff at dinner to mark the event and presented him with a gold watch.

Clinical Meeting of Diabetes Association.—The first meeting of the clinical section of the New York Diabetes Association was held, November 15, at New York University College of Medicine. Speakers were Louis I. Dublin, Ph.D., on "Statistics of Diabetes in the United States"; Dr. Herman O. Mosenthal, "The New York Diabetes Association"; F. W. Nordsiek, executive secretary of the association, "Survey of Diabetic Clinics in New York City," and Dr. Charles F. Bolduan, "Diabetes—A Health Problem in New York City."

Twenty Thousand Warnings.—New York's campaign against unnecessary noise entered its second phase, November 1, when the ban on noise, first applied only at night during October, was extended to include the day as well. Police were instructed to warn all persons who caused noises they could have avoided by being considerate. Typical instances included the unnecessary sounding of horns by motorists trying to blast their way through traffic; loud radios either in automobiles or in homes; attempting to call persons to windows by blowing horns; unnecessary racing of motors; workers congregating in front of establishments talking in loud tones at night; truck deliveries with undue noise; persons returning home in groups singing or talking loudly; cut-outs open on motorcycles, or trucks or vehicles with mufflers functioning badly; operators of cabarets, restaurants and dance halls in residential neighborhoods permitting loud music at unreasonable hours, and patrons of these places leaving at closing times using loud and boisterous language. During October the police issued 20,334 warnings and 172 summonses to noise offenders. Mayor La Guardia reported that notable progress had been made.

NORTH CAROLINA

Personal.—Dr. Ransom L. Carr, Rose Hill, has been appointed health officer of Duplin County to succeed Dr. Clarence H. White, Kenansville, resigned.

Society News.—Dr. Olin B. Chamberlain, Charleston, S. C., was guest speaker at the fall meeting of the Tenth District Medical Society in Tryon, October 16; his subject was "Anemia and the Nervous System." Other speakers were Drs. Paul T. McBee, Marion, on peptic ulcer; John C. Young, Asheville, genito-urinary diseases; Roy H. Moore, Canton, blood transfusion, and Cecil C. Swann, Asheville, sinus disease and chronic conditions of the chest.——Dr. Harold S. Clark, Asheville, addressed the Buncombe County Medical Society, Asheville, October 7, on "Acute Virulent Infections of the Hand."——Dr. Edwin A. Merritt, Washington, D. C., addressed the Wayne Medical Society, Goldsboro, October 4, on radiotherapy in treatment of tumors and cancer.

OHIO

Personal.—Dr. Herbert D. Chamberlain, McArthur, has been appointed health commissioner in charge of a new health unit in Vinton County.——Dr. Fred G. Carter, superintendent of the Ancker Hospital, St. Paul, has been placed in charge of Christ Hospital, Cincinnati.

Annual Health Conference.—The sixteenth annual conference of health commissioners with the state department of health was held in Columbus, November 13-15. Guest speakers were Drs. Jay Arthur Myers, Minneapolis, on tuberculosis; Eugene L. Bishop, Knoxville, Tenn., on health and sanitation in the Tennessee Valley; Martha M. Eliot, Washington, D. C., maternal and child health; John Collinson, U. S. Bureau of the Census, Washington, vital statistics, and James A. Doull, Cleveland, a survey of the state health department.

New Huron Road Hospital.—A new building for the Huron Road Hospital, Cleveland, with an eventual capacity of 300 beds, was recently opened. The building is six stories high

and is arranged in three wings, one of which is used for a nurses' home at present. The two wings forming the front of the building provide 200 beds. Five floors are devoted to regular service; on the fifth is a nursery, and the operating suite is on the sixth. There are no wards as such. Each room unit consists of two semiprivate two-bed rooms separated by a service area. On the ground floor are the outpatient department, dining rooms and kitchen, the pharmacy and the physical therapy department.

Society News. — Dr. Homer F. Swift of the Rockefeller Institute for Medical Research, New York, addressed the Cleveland Academy of Medicine, November 15, on rheumatic fever. Major Gen. Charles R. Reynolds, surgeon general of the U. S. Army, addressed a special meeting of the military medicine section of the academy, November 6, on "The Employment of the Medical Profession in Time of a National Emergency."——Dr. Henri Coutard, chief of service of roentgenology, Curie Institute, University of Paris, gave a lecture on radiation therapy at the University of Cincinnati, October 11, under the auspices of the university and the Cincinnati Cancer Control Clinic.——Dr. Edward C. Rosenow, Rochester, Minn., addressed the annual joint meeting of the Toledo Academy of Medicine and the Toledo Dental Society, November 1, on "Focal Infection and Elective Localization of Bacteria."

PENNSYLVANIA

Personal.—The trustees and staff of Allentown Hospital gave a testimonial dinner in honor of Dr. Robert L. Schaeffer, chief surgeon at the hospital, October 31, celebrating the twenty-fifth anniversary of his association with the institution.

Society News.—Drs. William Bates and Robert H. Ivy, Philadelphia, conducted the fall clinic of the Lycoming County Medical Society, Williamsport, November 8. Dr. Bates discussed "Back Sprains—First Lumbar Neuralgia" and Dr. Ivy, "Maxillofacial Surgery."——Drs. Ralph P. Beatty, Uniontown, and Harry J. Bell, Dawson, addressed the Fayette County Medical Society, Uniontown, November 7, on "Prostatic Obstruction" and "The Art of Prognosis," respectively.

Hospital News.—A campaign for funds for the Warren General Hospital, Warren, resulted in raising $56,000, which was $11,000 more than the amount sought. Physicians subscribed $1,800, it is reported.——The first annual meeting of the Association of Resident and Ex-Resident Physicians of the George F. Geisinger Memorial Hospital, Danville, was held October 25-26. Drs. Harold L. Foss and Carl E. Ervin conducted surgical and medical clinics and members of the association presented papers. Dr. Henry K. Seelaus, Philadelphia, was elected president.

Philadelphia

Society News.—Speakers before the Philadelphia Academy of Surgery, November 4, were Drs. William R. Gilmour, on "Gas Gangrene in Civil Practice"; John W. Klopp, "Tetanus: Experience of the Episcopal Hospital in the Past Thirty Years," and Ralph S. Bromer, "X-Ray Treatment of Acute Infections."——At a meeting of the Philadelphia Laryngological Association, November 5, speakers were Drs. Samuel Cohen, on "Present Status of Rhinoplastic Surgery"; Matthew S. Ersner, "Amputation of the Nose, Corrected by Various Forms of Prostheses," and George W. MacKenzie, "Nystagmus."——Edgar A. Doll, Ph.D., Vineland, N. J., and Dr. Bronson Crothers, Boston, addressed the Obstetrical Society of Philadelphia, November 7, on "The Behavioral Consequences of Birth Injuries" and "The Validity of the Diagnosis of Birth Injury After the Neonatal Period," respectively.——Drs. Eldridge L. Eliason and Lewis K. Ferguson addressed the Philadelphia Roentgen Ray Society, November 7, on "Intestinal Obstruction" and "Epiphyseal Separation," respectively.

SOUTH CAROLINA

Founders Day at Medical College.—Dr. David Riesman, Philadelphia, delivered the Founders Day lecture at the annual celebration of the Medical College of the State of South Carolina, November 13. Dr. Riesman's subject was "The Clinical Approach." During the day members of the faculty conducted clinics on various subjects and Dr. Riesman conducted a medical clinic in the afternoon. The occasion was the one hundred and eleventh anniversary of the opening of the college.

Society News.—At a meeting of the Fourth District Medical Association, Gaffney, October 15, speakers included Drs. John R. Harrison, Greer, on "Infections of the Upper Respiratory Tract"; Everett B. Poole, Greenville, "Physiologic Factors in the Production of the Allergic State," and William McNeill Carpenter, Greenville, "What the General Practitioner Should Know About Glaucoma." —— Speakers at a meeting of the Third District Medical Association, October 18, included Drs. Abraham Ellis Poliakoff, Abbeville, on "Treatment of Nephritis"; William S. Judy, Greenville, "Treatment of Certain Endocrine Disorders," and George R. Wilkinson, Greenville, "Principal Cause of Backache in the Latter Half of Life."—— Dr. Grady S. Clinkscales, Anderson, presented a paper on artificial pneumothorax at a meeting of the Anderson County Medical Society, Anderson, October 9. —— Dr. Kenneth M. Lynch, Charleston, addressed the Columbia Medical Society, October 14, on cancer of the liver.

TENNESSEE

Health at Nashville. — Telegraphic reports to the U. S. Department of Commerce from eighty-six cities with a total population of 37 million indicate that the highest mortality rate (21.4) for the week ended November 2 appeared for Nashville and that the rate for the group of cities was 10.9. The mortality rate for the corresponding week of 1934 was 15.8 for Nashville and 10.6 for the group of cities. The annual rate for the eighty-six cities was 11.3 for the forty-four weeks of 1935 and the same rate appeared for the corresponding period of the previous year. Caution should be used in the interpretation of these weekly figures, as they fluctuate widely. The fact that some cities are hospital centers for large areas outside the city limits or that they have a large Negro population may tend to increase the death rate.

TEXAS

Society News.—A symposium on medical economics will be presented at a meeting of the Dallas County Medical Society, November 27, by Drs. Holman Taylor, Fort Worth; Martin L. Wilbanks, Greenville, Texas; John H. Burleson, San Antonio, and Oscar M. Marchman, Dallas. Drs. John R. Lehmann and James T. Mills, Dallas, addressed the society, October 24, on "The Marijuana Menace" and "Treatment of X-Ray Burns," respectively.

Relief Agreement Terminated.—The Texas State Medical Association terminated its agreement with the Texas Relief Commission governing emergency medical relief, October 1. Any further service of this kind will be carried on through agreements between county medical societies and county relief administrations, the state medical journal announces. Under the arrangement the state association made no contracts, the journal points out, but agreed to foster contracts of the county societies and to serve as a board of adjustment. The whole affair has been a service, and the majority of those who have served under these contracts have done so at a loss and with no little discomfort. On the whole, it was conducted effectively both on the part of the medical society and on the part of the relief commission, the editorial concludes.

VIRGINIA

State Medical Election.—Dr. James Morrison Hutcheson, Richmond, was chosen president-elect and Dr. Philip St. Leger Moncure, Norfolk, was installed as president of the Medical Society of Virginia at the annual meeting in Norfolk, October 15-17. Vice presidents elected are Drs. Charles Lydon Harrell, Norfolk; Edmund M. Chitwood, Wytheville, and John A. Owen, Turbeville. Miss Agnes Edwards was reelected executive secretary and treasurer.

Personal. — Dr. William Grossmann Jr., Petersburg, has been appointed assistant epidemiologist in the state department of health. —— Dr. Shockley D. Gardner, South Boston, has been appointed health officer of the Valley Health District, with headquarters in Harrisonburg.——Dr. James N. Dudley, Danville, has been appointed director of the Henrico County Health District, with headquarters in Richmond.——Dr. Thomas B. Payne has been appointed health officer of Fredericksburg to succeed the late Dr. Justus Lee Cooke.

Centennial of Dr. Hunter McGuire.—The one hundredth anniversary of the birth of Dr. Hunter Holmes McGuire, distinguished Virginia surgeon, was celebrated by a ceremony in Richmond, October 11. William T. Sanger, LL.D., president of the Medical College of Virginia, presided at the exercises, which were held at Dr. McGuire's monument in Capitol Square. Speakers were Gov. George C. Peery; Drs. Marshall J. Payne, Staunton, and W. Lowndes Peple, Richmond, former students of Dr. McGuire, and Col. Robert T. Barton Jr., son of an intimate friend of Dr. McGuire. During the Civil War Dr. McGuire was medical director of the Army of the Shenandoah under the command of Stonewall Jackson, later surgeon to the Second Army Corps and medical director of the Army of Northern Virginia. After the close of the war he was for several years professor of surgery at the Medical College of Virginia. In 1893 he was instrumental in the founding of

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the University College of Medicine and the Virginia Hospital and was president of both institutions. He was also professor of surgery. He was one of the founders of the Medical Society of Virginia, of which he was president in 1880-1881. He was president of the American Surgical Association in 1886 and of the American Medical Association in 1893. He died Sept. 19, 1900.

WEST VIRGINIA

Society News.—Dr. William J. Engel, Cleveland, addressed the Cabell County Medical Society, Huntington, October 10, on "Diagnosis and Treatment of Cystitis in the Female."—— At a joint meeting of the Harrison, Monongalia and Marion county medical societies in Clarksburg, October 3, Drs. Harvey G. Beck and Albert E. Goldstein, Baltimore, spoke on "Chronic Carbon Monoxide Anoxemia" and "Nephralgia—Symptomatology, Diagnosis and Treatment," respectively.——Dr. John A. Kolmer, Philadelphia, addressed the Fayette County Medical Society, Montgomery, October 17, on "Infection, Immunity and Vaccination in Infantile Paralysis." —— Dr. Vincent V. Smith, Ironton, Ohio, discussed "Injection Treatment of Hemorrhoids" before the Logan County Medical Society, Logan, October 16.——At a meeting of the Greenbrier Valley Medical Society, Ronceverte, October 15, Drs. Andrew E. Amick and William P. Black, Charleston, spoke on infant feeding and treatment of hemorrhoids, respectively.

GENERAL

Award for Exhibit of Diagnostic Tests.—The U. S. Public Health Service and the American Society of Clinical Pathologists were awarded a certificate of merit for an exhibit on the evaluation of serodiagnostic tests for syphilis. A preliminary article describing the study now in progress on this subject appeared in THE JOURNAL, June 8, page 2083.

Search for Szent Norager.—The Minnesota State Board of Medical Examiners is attempting to find one Szent Norager, who has used the aliases Dr. James Edw. Petri and Dr. E. Mendoza. This man is of Danish descent, is between 35 and 40 years of age, and speaks English brokenly. He has represented himself in Minneapolis as being a doctor of medicine. Within the past year he has lived at the following addresses in Minneapolis: 1110 Ulysses Street, N.E., 4008 Thirty-Seventh Avenue, S., and 3863 Minnehaha Avenue. His present whereabouts are unknown. He has been represented as a "patent medicine" salesman and a fortune teller. Any information about this person will be appreciated by the Minnesota State Board of Medical Examiners, St. Paul.

National Academy of Sciences.—At the autumn meeting of the National Academy of Sciences at the University of Virginia, University, November 18-20, speakers will include:

Dr. Charles R. Stockard, New York, Giant Skin Growth on Mammals with Normal Sized Skeletons.
Dr. William H. Howell, Baltimore, The Production of Blood Platelets in the Lungs.
Dr. David I. Macht, Baltimore, Experimental and Clinical Study of Cobra Venom as an Analgesic.
Lyndon F. Small, Ph.D., University, Va., Studies of New Narcotics.
Carl C. Speidel, Ph.D., University, Va., Effects of Alcohol on Nerves in Living Frog Tadpoles.
Yandell Henderson, Ph.D., New Haven, Conn., How Cars Go Out of Control: Analysis of the Driver's Reflexes.

Nearly Nine Thousand Cases of Poliomyelitis.—While the number of cases of poliomyelitis reported this year is in excess of those reported for earlier years, the disease is on the decline at this time. According to *Public Health Reports*, 8,884 cases were reported throughout the country for the twenty-four weeks ended October 12, as compared with 5,944 during the similar period in 1934, 3,862 in 1933, and 2,843 in 1932. In this period this year, 2,601 cases were reported in New York and 1,232 in Massachusetts. Last year during this period the greatest number of cases, 2,937, was recorded for California. The cases reported were 3,625 for the four weeks ended September 7 and 2,528 for the four weeks ended October 5. Poliomyelitis has been most prevalent in the regions along the Atlantic coast. The South Atlantic states continue to report a rather high incidence, and in some states in the East North Central and South Central regions the incidence was somewhat above the seasonal expectancy. In the Mountain and Pacific regions the number of cases was only about 20 per cent of last year's figures for the period ended October 5, but it was slightly above that for each of the three preceding years. The West North Central states reported about the normal incidence for this season.

Society News.—At the fourth annual meeting of the Society of Plastic and Reconstructive Surgeons in Detroit, October 19, speakers were Drs. George M. Dorrance, Philadelphia, on "Surgical Treatment of Different Varieties of Cleft Palate"; Grover C. Penberthy, Detroit, "Treatment of Burns"; John M. Wheeler, New York, "Transplantation of the Human Cornea: Its Present Status," and George V. I. Brown, Milwaukee, "Restoration of Motion in Cases of Traumatic Facial Paralysis."——Dr. Charles A. Waters, Baltimore, was named president-elect of the American Roentgen Ray Society at its recent annual meeting in Atlantic City. Dr. Frederick M. Hodges, Richmond, was installed as president and Dr. Bernard H. Nichols, Cleveland, and Major John J. Moore, San Francisco, were elected vice presidents. Dr. Eugene P. Pendergrass, Philadelphia, was reelected secretary. The 1936 meeting will be held in Cleveland.——Dr. Lemuel Whittington Gorham, Albany, N. Y., was elected president of the American Clinical and Climatological Association at its annual meeting in Princeton, N. J., October 21-23. Drs. Alvah H. Gordon, Montreal, and Chauncey W. Dowden, Louisville, Ky., were named vice presidents and Dr. Francis M. Rackemann, Boston, was reelected secretary. —— Dr. Eugene H. Pool, New York, was chosen president-elect of the American College of Surgeons at the annual meeting in San Francisco, October 31. Dr. Donald C. Balfour, Rochester, Minn., was installed as president and Drs. Emile F. Holman, San Francisco, and George E. Wilson, Toronto, were elected vice presidents.——Dr. William C. Menninger, Topeka, was elected president of the Central Neuropsychiatric Hospital Association, which met in Topeka, October 26, in conjunction with the Central Neuropsychiatric Association. The next meeting will be in Chicago in March.

CANADA

Society News.—The annual meeting of the British Columbia Medical Society was held in Vancouver recently. Speakers at the annual dinner were Drs. James Tate Mason, Seattle, President-Elect of the American Medical Association, on "Medicine and Social Progress" and George J. Wherrett, Ottawa, executive secretary of the Canadian Tuberculosis Association, "Progress of Tuberculosis Control in Canada."—— Drs. George F. Strong and Alec M. Agnew addressed the Vancouver Medical Association, Vancouver, B. C., October 2, on "Cardiac Pain" and "Vaginal Plastic Surgery," respectively.

LATIN AMERICA

Appointed to Leprosy Center.—Howard I. Cole, Ph.D., formerly chief chemist of the Culion Leper Colony, P. I., has been appointed by the League of Nations to conduct research at the new International Leprosy Center in Rio de Janeiro, according to *Science*.

Society News.—The Medical Society of Mendoza, the Argentine Society of Regional Pathology of the North, dedicated its ninth meeting to Prof. Carlos Chagas, Rio de Janeiro, who died in December 1934. The session was held in Mendoza, October 1-3.——The third Pan-American Red Cross Conference was held in Rio de Janeiro, Brazil, recently.

FOREIGN

International Congress of Surgery in Cairo.—The tenth International Congress of Surgery will be held in Cairo, Egypt, December 30 to January 4, under the presidency of Prof. Anton von Eiselsberg of Vienna. Subjects of the scientific sessions will be surgery of the parathyroids, surgery of the lumbar sympathetics, surgery of the colon exclusive of cancer, and surgical conditions in bilharziasis. For information address Dr. L. Mayer, general secretary, 72 rue de la Loi, Brussels, Belgium.

Personal.—Dr. Ernest W. H. Cruickshank, professor of physiology, Dalhousie University Faculty of Medicine, Halifax, N. S., has been appointed to the regius chair of physiology at the University of Aberdeen to succeed the late Dr. John J. R. Macleod.——Drs. John A. Ryle, Cambridge University, and Matthew J. Stewart, professor of pathology, University of Leeds, have been appointed members of the Medical Research Council of Great Britain to succeed Lord Dawson of Penn and Prof. Arthur E. Boycott.

Dr. Birkhaug Returns to Norway.—Dr. Konrad E. Birkhaug, who was for several years associate professor of bacteriology at the University of Rochester School of Medicine and Dentistry, Rochester, N. Y., has been appointed to the chair of experimental medicine at Christian Michelsens Institutt, Bergen, Norway, a position created for him. Dr. Birkhaug is a native of Bergen. He received his medical education partly in Europe and graduated from Johns Hopkins University School of Medicine, Baltimore, in 1924. He went to Rochester in 1925, remaining until 1932, when he joined the Pasteur Institute in Paris as an investigator. At Bergen he will work on experimental tuberculosis and leprosy. While in Rochester Dr. Birkhaug was honored with a civic award in recognition of his work on erysipelas.

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Foreign Letters

LONDON

(From Our Regular Correspondent)

Oct. 19, 1935.

"A Nation of Medicine Drinkers"

Sir Kingsley Wood, the minister of health, attended a meeting of the London Insurance Committee (a committee of physicians, which administers the panel system). He made a comparison between the conditions of today and those of 1917-1918, when he himself was chairman of the committee. They showed a tremendous increase not only in the numbers entitled to medical benefit but in the number of physicians. The latter had increased from 1,300 to 2,174, and it was satisfactory to note that the payments had gone up from $2,330,000 to $3,500,000. But the figures which took his eye were those indicating a rise in the number and cost of the prescriptions in London. The prescriptions dispensed in the year he was chairman totaled 4,377,000; last year they numbered 8,482,000. This was partly accounted for by the increase in the number of the insured persons and the fact that new and expensive medicines had been introduced. But we in England were apparently becoming "a nation of confirmed medicine drinkers," and he doubted whether that was to our good. In England many patients had come to regard a visit to the doctor as synonymous with the receipt of medicine. Scotland, however, had no such love for bottles of medicine. The result was that the cost of medicine under the panel in England exceeded that in Scotland by 58 per cent. There were no known facts connected with the incidence of disease to account for that wide difference. He did not think that the standard of treatment in Scotland was lower or the results of treatment less satisfactory. A considerable portion of the outlay on drugs could be eleminated with advantage to the proper treatment of the people. Sir Kingsley did not go to the root of the matter, which is that the English working class has a profound belief in bottles of medicine and likes to take it. Under the panel system it is to be had without payment, and physicians do not care to endanger their popularity by refusing to prescribe. Of course the placebo has always existed in medical practice and sometimes is unavoidable; but, when it is to be had only for the trouble of visiting or sending to the panel physician, the result is obvious. As reported previously in THE JOURNAL, a small payment for each bottle of medicine has been suggested as a check, and this has actually been adopted in Canada.

The Right to Die

Euthanasia is a constantly recurring subject of discussion both in the profession and among the people. Various proposals have been made to give the physician the legal power to terminate suffering in incurable disease, and of course objections have been made on religious or other grounds. At last a society called the Voluntary Euthanasia Legalisation Society has been formed. Its object is summed up in the following words: "Individuals who have attained to years of discretion, and who are suffering from an incurable and fatal disease which usually entails a slow and painful death should be allowed by law, if they so desire and if they have complied with requisite conditions, to substitute for the slow and painful death a quick and painless one." The society has received influential support from physicians, lawyers, churchmen, politicians and others. Lord Moynihan is the president, and the executive committee includes Sir Humphry Rolleston, formerly president of the Royal College of Physicians; Sir Walter Langdon Brown, emeritus professor of physic, Cambridge University; Sir James Purves-Stewart, neurologist; Sir Leonard Hill, physiologist; Sir Pendrill Varrier-Jones, founder and director of the Papworth Village Settlement for Tuberculosis; Sir George Seaton Buchanan, vice president, League of Nations Health Committee; Sir W. Arbuthnot Lane; Prof. Julian Huxley, biologist and author; Prof. H. J. Laski, professor of political science, London University; Rev. Prof. J. M. Creed, professor of divinity, Cambridge University, and the earl of Listowel, a writer whose books include "The Values of Life." To meet possible objections on religious grounds, a statement that what is proposed is not contrary to Christian principles has been signed by well known churchmen such as Dean Inge; Dr. Matthews, dean of St. Pauls; Canon H. R. L. Sheppard, and Dr. T. Rhondda Williams, chairman of the Congregational Union. An inaugural public meeting of the society will be held in London in December. Any one can become a member for the single minimum payment of $1. A lawyer has superintended the drafting of a bill entitled "The Voluntary Euthanasia Bill," which will be brought forward by Lord Moynihan in the house of lords. It is hoped to arouse public support for the bill to enable persons in great pain and with no hope of recovery to be relieved with their own consent. There is no question of enabling a person to be put out of pain against his will. The public will be safeguarded by the necessity of obtaining the signatures of two physicians. The idea has been in the minds of many people for a long time. The bill and the formation of the society are the result of four years of untiring work by Dr. C. Killick Millard, until recently health officer for Leicester. The wording of the application form as proposed in the bill is as follows: "I am....years of age and am suffering from a disease involving severe pain, which, as I am informed, is of an incurable and fatal character. I have consulted my nearest relatives and have to the best of my ability set my affairs in order. I have requested ....., a medical practitioner holding a license under the act, to administer euthanasia if permission is granted and he has consented to act. I am desirous of anticipating death by euthanasia and hereby make application for permission to receive euthanasia." If the referee, after seeing the applicant, gives his permission, the applicant would be given seven days to change his mind.

In a press interview Lord Moynihan said that he did not think there was a physician of long experience in this country who had not had requests for death made to him by patients. "Many people," he added, "insist that 'God sent suffering into the world.' But they seem to forget that God also sent the means of relief. Our duty at present seems to be to keep people alive, even when their lives are useless, at the expense of great suffering. Some of us in the medical profession are unhappy when this necessity is inflicted upon us. We feel that under the strictest supervision power should be given to end life that is a curse to itself and a torture to all who love the afflicted individual. There is nothing compulsory about our proposals. The patient would decide for himself or herself whether the right to die should be exercised." Asked if he himself would submit to euthanasia if he were suffering from a painful incurable complaint, Lord Moynihan said, "I do not know anybody who would not."

THE RIGHT TO KILL

English law recognizes no right to kill except in cases of self defense. The termination of hopeless suffering gave rise to a trial for murder a few days before the formation of the Voluntary Euthanasia Legislation Society was announced. There was the difference that death was not voluntary on the part of the patient. At the central criminal court a woman, aged 22, was tried for matricide. Her mother was in a hospital suffering from dementia paralytica. Evidence was given that she was devoted to her mother and that her great interest in life was the hope of her recovery. Her visits to the hospital so distressed her that friends tried to prevent her from going. Finally she got hold of a prescription for soluble barbital and by going to various pharmacists obtained 160 grains (10 Gm.). She stated

that she put the barbital in four peppermint creams and gave it to her mother "as an act of pity." The mother died and Dr. Roche Lynch, government analyst, gave evidence that death was due to bronchopneumonia and that a fatal dose of barbital had been administered. He did not think that the sweets could have contained as much as 160 grains, having regard to their size, but 50 grains (3.25 Gm.) was an average fatal dose. The judge pointed out to the jury the danger of accepting the defendant's plea, "I killed in pity." Sympathy had no place in the finding of a verdict, but if they returned a verdict of "guilty" they might make what recommendation for mercy they desired. They should do their duty with firmness and resolution. The case was of great public importance. If the defendant caused death, she did so for a reason which could not be justified in this or any other country. Whether the disease from which her mother was suffering was incurable or not was not a question for them or for him. If life was shortened only by a day, that constituted murder. However, the jury returned a verdict of "Not guilty" and the prisoner was discharged. There does not appear to be any other case in which such a plea was accepted, and the verdict was clearly contrary to the law.

Facilities for Physical Training

Representatives of 140 national organizations concerned with recreative physical activity, with other delegates numbering over 300, attended a conference in London organized by the Central Council of Recreative Physical Training. Lord Astor, who presided, said that at present only 10 per cent of the juvenile population had facilities after they left school for regular exercise. Many young persons deteriorated physically when they no longer had organized exercise or the discipline of school, and the enforced idleness endured by some sapped their mental and physical alertness. Capt. S. J. Parker, government staff inspector of physical training, said that the conference marked the beginning of an effort long overdue to provide means whereby the benefits of physical training and recreative activity might be made readily available to those of postschool age. The work of national voluntary associations was of inestimable value as a foundation, but correlation of their activities was necessary. It then remained to provide for those not associated with any organized body. There was a widespread demand among people living in unfavorable social conditions for help to get things going. They must consider what could be done to ensure the continuity of rational physical training from the school onward. The board of education was about to issue for the guidance of voluntary bodies and local authorities two books on recreation and physical fitness, one for youths and men and another for girls and women. Another publication would give advice with regard to gymnasiums and equipment. An adequate supply of trained leaders was a necessary preliminary to progress. The central council proposed to organize a summer vacation course for 500 leaders at the Carnegie Physical Training College. One member suggested the establishment of a national physical training college and stated that he happened to have a site which he thought would be ideal for the purpose. He would be glad to hand over to the council as much land as it desired for the erection of the college. It was announced that this offer would be considered by the executive committee.

Social Progress and the Unfit

In an address to the York Medical Society, Lord Dawson, president of the Royal College of Physicians, said that as society had developed natural selection had lessened. Today the progress of medical science, the qualities of justice and mercy, and the organized efforts of the community were bringing it to naught. And so the "unfit" were preserved. Nature's method of securing quality of population involved a high death rate as well as a high birth rate. In this way there was a wide, though rough, selection. If nature's method of a high death rate was displaced, quality of population must be secured in another way. Much was heard of economic "planning" in order to secure greater welfare for the people. What would this avail unless a like attention was given to "planning" for a healthy race?

Civilization, having in large measure nullified nature's methods of eliminating the unfit, needed to replace these methods by control of environment and inheritance. This could be done by methods of nurture to build up fit citizens, having regard to their biologic capacities, and by preventing damage to the community by the "unfit" producing bad stock and bad homes. A missionary campaign throughout the land to teach housewives the values of essential foodstuffs and how to cook was desirable. The right nourishment of the young body was so important that the assumption by the state of an adjunctive responsibility for the feeding of children became justified. Physical education should be a prominent, if not the first, item in the school curriculum.

Turning to prevention, Lord Dawson said that sterilization should be done in the interests of the race. It was a branch of therapy comparable to inoculation. But there were no means by which carriers of defects that would appear when mating took place with a similar carrier could be detected, though it was not unreasonable to hope that such might be discovered. On the other hand, persons with mental defects were a demonstrable danger, and those with the milder forms were able to live in the community. Sterilization was a restraint of freedom to procreate, but the law already restrained liberty in matters of communal health. Why, therefore, should not future generations be protected? The practice of sterilization was not new; rather, this country had lagged behind. It had been in force in Switzerland for nearly fifty years, and in California and certain other states for a long period. It was now recognized in Denmark, Sweden, Norway, Finland and Germany as a means of preventing hereditary physical and mental defects from damaging the stock.

British Ambulance for Abyssinia

The British Ambulance for Abyssinia has been officially recognized by the British and Ethiopian governments. Advance officers dispatched from this country have reached their destinations and are making arrangements for the entry of personnel and transport into Ethiopia through French or British Somaliland. In the neighboring British colonies of Kenya and Uganda, trained native medical personnel is being recruited with the cooperation of the governor. It is already stated that forty native dressers and three Indian subassistant surgeons are available. Arrangements are being made in London, as far as the funds allow, to dispatch medical officers. Young unmarried men with some surgical experience are preferred. An appeal for funds has been made to the British public and the response has been remarkable in the large number of small subscriptions received, showing the sympathy of persons who are not in affluent circumstances. When complete, the unit will consist of one field hospital and one casualty clearing station with seven medical officers, two administrative officers, transport officers, trained dressers and equipment. The sum of $175,000 is required for sending out this ambulance and maintaining it in the field. An urgent message has been received in London from the emperor of Ethiopia stating that the northern army is without medical aid and urging that an ambulance unit should be sent. The address of the British Ambulance Service in Ethiopia is 33 Alfred Place, London, S. W. 7. At the same time the Save the Children Fund is organizing relief for Abyssinian refugees in the neighboring British colonies of Somaliland and Kenya. The London missionary societies are making arrangements for their missionaries, of whom some are physicians and others have had some medical training, to do ambulance and hospital work. There are also American missionaries taking up this work.

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PARIS

(From Our Regular Correspondent)

Oct. 11, 1935.

Forty-Fourth Annual Surgical Congress

The French Surgical Association held its annual congress at Paris during the week of October 7. The subjects chosen last year to be discussed at the present meeting were (1) infarct of the mesentery, (2) fractures of the os calcis and (3) technic and physiologic sequelae of operations on the diaphragm. As is customary in the larger French societies, two members are appointed at the preceding annual meeting to prepare a complete survey of a given subject and to read this report in abstract form at the following annual congress. A copy of such a report in monograph form is sent to each fellow of a society a month before the meeting, so that a complete discussion can take place as soon as the abstract has been read at the congress.

Drs. Ameline of Paris and Lefebvre of Toulouse submitted an exhaustive review on "Infarct of the Mesentery." Although it was originally considered as always due to a mechanical obstruction of the mesenteric vessels, more recent clinical and experimental observations have shown that other causes play an important part in the etiology; hence the best definition of the infarct is an "ensemble of circulatory disturbances, ending in the escape of blood into the tissues of the mesentery and of the corresponding portion of the intestine."

(*a*) Pathologic Anatomy: Recent studies, especially those of Hovelacque, show that a free anastomosis exists between the mesenteric vessels. It is impossible to distinguish, on naked-eye or microscopic examination, an infarct of arterial from one of venous origin. Of special interest are the cases of infarct without apparent vascular lesions and also those of infarct that recover spontaneously. The infarct is always limited to a certain segment and is accompanied by a serosanguineous peritoneal exudate and a hemorrhagic exudate into the wall of the involved small intestine.

(*b*) Etiology: A hard and fast line can no longer be drawn between venous and arterial lesions, because they are constantly associated, from both the anatomic and the pathologic standpoints, even without intervening involvement of the capillaries. Infarction can occur at any age and not, as was formerly believed, only in elderly persons. About two thirds of the reported cases have been in males. Among local causes, appendicitis, salpingitis, enteritis and gastroduodenal ulcers deserve mention. Among general causes, cardiovascular disease, blood dyscrasias such as purpura and hemophilia, infections, diabetes and operations on the gastro-intestinal tract are to be considered. In seventy-one of 490 cases there was a history of such an operation within a reasonable period before the infarct. In ninety-seven cases, referred to for the present as cryptogenic, no local or general cause could be found.

(*c*) Clinical Aspects: Infarct of the mesentery as a rule presents the clinical picture of an acute onset, with a pain of variable intensity, most often referred to the right iliac or umbilical or epigastric region and accompanied by vomiting of a bilious or bloody (10 per cent of the cases) character. Although signs of intestinal paresis are most frequently observed, a serous diarrhea may occur. Bloody stools were formerly believed to be pathognomonic of infarct, but this symptom was observed in only one fifth of the cases. The abdominal examination is of little aid, because rigidity is generally absent and there may be only slight tenderness, which increases as one approaches the involved segment. On percussion, according to Mondor and Ameline, there is well marked dulness over the infarcted segment.

Shock appears early. None of these clinical signs are pathognomonic for infarct. Examination of the blood reveals a rapidly increasing leukocytosis. Roentgenographic study has thus far not been of any aid.

The acute conditions that are most frequently mistaken for infarct are ileus, peritonitis and acute appendicitis. The clinical signs of these are not so different in type from infarct but they differ sufficiently to enable a preoperative diagnosis of infarct to be made. In ileus the abdominal distention is more marked, there is little pain or shock and vomiting occurs later.

In diffuse peritonitis the abdominal distention is more generalized, the vomiting is more of the projectile type and the pain is not localized. In acute appendicitis the abdominal rigidity and tenderness are in the right iliac region, the pain is less intense and there is no shock.

The prognosis of mesenteric infarct has not improved much recently. There were 331 deaths (operative and nonoperative), or 73.55 per cent, among 450 collected cases, and 120 cures, or 26.45 per cent. The most unfavorable cases are those of cardiovascular origin, the mortality rate being 90.67 per cent. The more favorable cases are those in which there has been no previous illness. In these the mortality was 62.2 per cent. The authors were able to collect twenty-one cases in which spontaneous recovery occurred.

(*d*) Pathogenesis and Mechanism: Simultaneous arterial and venous obstruction is most common, but infarct may occur without a vascular lesion. The rôle of the nervous system in the form of vascular spasm is certainly more important than has heretofore been considered to be the case. The same is true of infection and of anaphylactic or toxic shock.

(*e*) Treatment: Of the 450 collected cases, operation was performed in 332. After simple exploration there were eighty-seven deaths and twenty-one recoveries. After resection, short-circuiting, and so on, there were 131 deaths and ninety-three cures. Resection hence offers the best chances of success.

In the discussion, Havliceck of Czechoslovakia called attention to his work showing direct anastomosis between arteries and veins without intervening capillaries. This has been confirmed by others for various viscera.

Leriche of Strasbourg believed that the anatomic and not the physiologic factor had been considered too long. The intestinal circulation possesses a vasomotor regulatory mechanism, as does that of the vessels of the extremities.

Arterial pathology is primarily a functional disturbance, and mesenteric infarct is due to the same mechanism as vascular troubles in general. The infarct is the result of the anemia, the hemorrhagic infiltration being secondary. For this reason the process may cease in the "spasm" stage and recovery may result.

Important Notice on BCG Vaccination

The commission appointed by the Pasteur Institute to investigate the efficacy and also to receive reports of the failures of the BCG vaccination method against tuberculosis in infants has issued a statement to the effect that animal experiments and clinical observation show that the immunity conferred by the BCG (Calmette-Guérin vaccine) is established only after a certain length of time, often only after a long interval, and that during this period the infant is susceptible and can be infected as if it had not been vaccinated. Hence it is essential to avoid all contacts with tuberculous individuals during this period. Such isolation is as necessary for vaccinated as for nonvaccinated infants.

Opposition to Social Insurance Orders

A recent order by social insurance authorities, to the effect that records of insured workers while under treatment in private hospitals must be accessible to medical inspectors for the social insurance organizations, is arousing both criticism and protests. The Société de chirurgie passed a resolution at the June 20 meeting to the effect that such a rule is contrary to the duty of a physician or surgeon as to professional secrecy, and placed itself on record as opposed to any ruling that would allow such records to be open to inspection by representatives of the social insurance authorities.

BERLIN

(From Our Regular Correspondent)

Sept. 23, 1935.

Rigorous Requirements for Obtaining the Title of Doctor

For many years attention has been called, both at home and abroad, to the fact that the bestowal of the title of doctor by German universities is not in keeping with the dignity that the title is supposed to convey. Particularly during the period immediately following the World War, things went so far that every one who planned to play any prominent part in society or in industrial life felt obliged to secure some sort of doctor's title. It has been rumored that at many universities, particularly at the smaller provincial institutions, there has been a tendency to "let down the bars," and even the comic journals have made the new "doctors" the butt of their jokes. It is alleged also that the honorary title *doctor honoris causa* has often been attained in the simplest manner—sometimes as evidence of appreciation of a considerable gift of money. Respect for the doctor's degree has consequently been lowered in the public mind, in spite of many attempts on the part of the more discerning members of academic circles to check the growing lack of confidence. Some sixty years ago Theodor Mommsen, historian of the University of Berlin, published his article on "The German Pseudo-Doctors," which aroused a great furor. The publication of this revealing article led to the adoption of the regulation that a certain number of copies of a doctor's thesis must be printed and circulated, which furnished an effective means of public control of the various faculties of the universities. At that time the examinations for the doctor's degree constituted also a considerable source of income. The pecuniary feature of the problem was later partly solved by issuance of the decree that the examination fees should not be credited in full to the examiners but should go chiefly into library, university and faculty funds. What did not go into these funds was to be divided among the four examiners who held the oral examinations and the two persons selected to discuss the contents of the thesis presented by the candidate for the doctor's degree.

Now the minister of public instruction (Rust) has made several sharp changes in the regulations. The graduation fees incident to the obtaining of the doctor's degree at any German university have been placed uniformly at 200 marks ($80, current), which sum is payable in full into the government treasury, the professors receiving no part of it. University instructors will henceforth perform the work of examiners as part of their regular duties. The reasons assigned for this decree are significant: The bestowal of the title of doctor is one of the most exalted rights of the faculties of the German universities. The exercise of this right is associated, however, with certain high obligations. . . . Under all circumstances, therefore, the university authorities must see to it that only such students or scholars are admitted to the examination for the doctor's degree as have shown that they are competent to state a problem correctly, to grasp its significance, and to elaborate on it in accordance with scientific methods. The doctor's degree must never be bestowed for superficial reasons as a complement of a successfully passed government (or similar) examination, on the basis of a more or less formal performance. Through the granting of degrees on a flimsy basis the German doctor's degree has already lost much of its former prestige. The decree stipulates also that candidates for the doctor's degree must be the actual pupils and scientific collaborators of the instructor, and that between pupil and instructor a spirit of camaraderie must exist. Only under these points of view shall candidates for the doctor's degree be accepted and aided, and the rectors, or presidents, of the universities shall see that these requirements are observed.

This decree is intended to have a salutary effect on the conferring of the title of doctor of medicine. In the past it has often been granted in a routine way on the basis of a report on some clinical case or other which had no scientific value. The number of applicants for the doctor's title was greatly influenced by the actual or supposed advantages accruing therefrom to the possessor; that is, by the esteem in which it was held in the public mind. Through the operation of this decree the German doctor's degree will gain in prestige, although it may take some time for it to recover its former status.

Distribution of Medical Students in Germany

The matriculation of medical students at German universities for the summer semester 1934 (which included 890 foreigners) numbered 23,028. The largest proportion of these students are derived from the families of middle-rank officials (5,892) and merchants and industrialists (4,547). Only 2,391, or 10.8 per cent, are the sons of physicians, while about 30 per cent of the fathers of these students had a complete university training. It is evident, therefore, that our future physicians are recruited mainly from nonmedical circles. Slightly more than 1,000 students are from the families of agriculturists—chiefly from those of middle rank. Children of laborers have a comparatively high representation (315), being greater, for example, than the children of pharmacists (214). About 25 per cent of the women medical students are the daughters of higher officials and a further 25 per cent are from the families of middle-rank officials. The University of Munich has the highest representation of medical students (2,528); the University of Berlin comes next with 2,273 students; next in descending order come the universities of Würzburg, Königsberg, Bonn and Heidelberg. The University of Giessen has the smallest representation. Of the 890 foreign students (120 women), 517 are from Europe, most of them from Poland, Rumania, Danzig and Switzerland. There are only nine students from England and only one from France. From Asia there are seventy-one, forty-two being from China. Africa has furnished thirteen and North America 207, 206 being from the United States. From South America come forty-six, twenty-four from Peru. From the religious point of view, 327 foreigners were of the Protestant faith, 209 were Catholics and 173 were Jewish.

Criteria for Correct Nutrition

For some time the health authorities have given increased attention to the problems of nutrition. Another evidence of increased interest in nutritional problems is the fact that on August 1 a "department of physiologic nutrition" was established within the federal bureau of health, of which Professor Floessner was appointed director. Furthermore, the creation of a special official commission to deal with purely scientific nutritional problems is contemplated. The Reichsarbeitsgemeinschaft für Volksernährung, which recently established a set of criteria for correct nutrition, to be used in connection with the educational campaign, is working along the same line. The criteria state that an effective nutrition can be accomplished by means of a wide variety of diets and with the aid of widely different food articles. A onesided diet is condemned, irrespective as to whether it is a meat diet or a vegetarian or raw-food diet. The most important prerequisites of any diet are full food value and priceworthiness.

The basis of the educational and the publicity campaign for better nutrition lies in the paramount emphasis that is placed on a mixed, or well assorted, diet, which should comprise adequate amounts of fruits, green vegetables, and milk and milk products. Purely vegetarian nutrition is not advocated. If certain persons for some special reason wish to adopt a vegetarian diet, no objections need be made. However, an abrupt transition from a mixed diet to an exclusively vegetarian diet should not be undertaken without consultation with a physician. Raw food

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is valuable as supplementary nutrition, in the form of salads, fruit and the like, but an exclusive diet of raw foods should not be adopted by any one without a physician's endorsement. Diets influenced by cultist trends the reichsarbeitsgemeinschaft refuses to approve. As to what constitutes a suitable diet for various types of patients must not be made the subject of public lectures or of educational or publicity campaigns.

AUSTRALIA

(From Our Regular Correspondent)

Sept. 30, 1935.

Annual Meeting of British Medical Association at Melbourne

In recognition of the development of medicine in Australia, the one hundred and third annual meeting of the British Medical Association opened in Melbourne September 9 and continued for that week. On only three occasions has the annual meeting been held outside Great Britain, and Canada had been chosen for the previous two.

It became apparent at this meeting that Australian medicine possesses a tradition and a character of its own. In a country where many local delegates travel 2,000 miles in a straight line to the meeting but which contains a mere seven million people there are problems of medical care that are unique in the world. The juxtaposition of the temperate and tropical zones provides a range of pathologic possibilities and physiologic permutations that gives a lively variety to Australian medicine.

For the first time in the history of the association an Australian born was chosen as the president. In thus honoring Sir James Barrett, K.B.E., C.B., C.M.G., L.L.D., M.S., F.R.C.S., a distinguished ophthalmic surgeon and medicosocial organizer, the association also honored the illustrious sons of Australia, who in their native country and overseas have achieved eminence in most branches of their profession.

The meeting was also honored by the presence of medical scientists from Great Britain, who passed through the United States on the way. Incidentally, the British delegates expressed gratification at their kind reception during their crossing of America, their most intriguing experience being their tour of Chicago with the police patrol.

ANNUAL GENERAL MEETING

Adjourned July 23 from London across the world to Melbourne September 10, the annual general meeting opened the proceedings in the Town Hall in an atmosphere of austere procedure and colorful pageantry. One of the first acts of the newly elected president was to send, with the approval of the meeting, a cablegram to King George, the patron of the association, expressing loyalty and devotion. Before the conclusion of the meeting, a suitable reply was received. The governor general of Australia welcomed the members who had come from other parts of the empire and said that the importance to mankind which every congress of this nature carries is heightened by the inspiring fact that this notable assembly is an interimperial one. The following representatives of other associations were introduced and welcomed to the meeting: Canadian Medical Association, Dr. R. D. Rudolph and Dr. Ritchie; Federal Council of the Medical Association of South Africa, Dr. C. M. Murray; Chinese government and Chinese Medical Association, Dr. Wu Lien-teh; Japanese Medical Association, Dr. Genzo Katoh; Australian Federal Council, Sir Henry Newland. A distinguished foreign guest, Dr. K. Herman Bouman of Amsterdam, and delegates from overseas dominions, colonies, dependencies and mandated territories, were also received officially. An award of the association was presented to a Melbourne scientist, Dr. F. M. Burnet, for his work on bacteriophage and virus diseases.

THE PROBLEMS OF THE HOSPITAL SYSTEM

In his presidential address, Sir James Barrett urged the members to take charge of the future of the hospital system. "If hospitals are nationalized, the whole medical profession will inevitably sooner or later be nationalized," he declared. "The choice must be made, or we may drift by indecision into a position difficult to justify or to alter. The fault of the present hospital system is that the economic gap between the public hospitals and the so-called intermediate hospitals and the private hospitals is too great and should be bridged by a contributory system such as bush nursing, in which case the hospital charges for intermediate patients may be made very small. If such a contributory system is adopted by the profession, the profession will exercise its just influence in managing it. If, on the other hand, it is supplied by the state or other organizations and the members of the medical profession do not play an active part in its establishment, then their control and influence will probably be negligible. Now is the time to decide and to choose which system is preferable." In dealing with the main subject, Sir James Barrett discussed four different systems: (1) the Victorian Bush Nursing Association, (2) the hospital system of Victoria, (3) the hospital system of Great Britain and (4) the hospital system of New Zealand.

The bush nursing movement began in 1911 and had developed steadily until in 1925 there were forty-four nursing centers and three hospitals. As hospitals were established the contributory scheme that had been applied to the nursing centers was transferred to them. Contributors could obtain unlimited nursing and hospital attention for themselves and their dependents up to a certain age for £2/2/- a week, but all patients had to make their own arrangements with their medical attendant, a system which, being essentially human, had worked exceedingly well. These hospitals receive and request nothing from the government for construction and, except in six instances of special and really historical interest, nothing for maintenance. They must maintain themselves or close. So far none have closed, and at present these hospitals, staffed by doubly and trebly certificated nurses and not by trainees, by nurses who are the best paid nurses in the state, provide the cheapest hospital accommodation in the state. From one third to one sixth of the cost of construction has been borne by the Edward Wilson partnership and the H. V. McKay trust. The remainder has been provided by the districts that own them.

Sir James Barrett explained that the public hospitals in Victoria were maintained by voluntary contributions, by government subsidy and by the contributions of patients. There were also intermediate hospitals, mostly organized by religious bodies, at which the charges, although in his opinion too high, were less than those of the private hospitals. In pointing out the difficulties of financing the present system, he said that 85 per cent of the taxpayers in Victoria received £300 a year or less. Many of that percentage would have to receive necessary hospital and nursing attention at rates within their means. The sole cause of the hospital problem was that thousands of people now resorted to the public hospitals who did not before. A great change of attitude has taken place and we shall have to alter our ideas and outlook and meet the difficulties arising from it. "Are we to abandon our voluntary charitable system and nationalize—that soothing word!—our hospital service?" asked Sir James Barrett. "If so, we shall lose the humane feelings of the public and of the profession which brought the hospitals into existence and which have ensured their continuance. The medical staff must then cease to be honorary. Unless the experience of other countries misleads us, the cost will be great if efficiency is to be maintained. One essential factor has not been faced. It is quietly assumed that the medical expert will continue to act as if the system were a charitable one, so far as he is concerned. If nationalized hospitals make their appearance, the medical officers must be adequately paid if efficiency

is desired. Intermediate hospitals are not cheap enough. Why should the contributory bush nursing principle not be applied, and the cost to the patients be substantially reduced? Why should there not be hospitals of the bush nursing type in the suburbs?"

PUBLIC CONTROL OF HOSPITALS

The author of a surgical textbook of world-wide use, Prof. E. W. Hey Groves, professor of surgery at the Belfast University, delivered the first Hamilton Russell memorial lecture at the Royal Australasian College of Surgeons. "I say with all the emphasis at my command that the time has come when every hospital which undertakes the treatment of the sick and the investigation of disease must come under public control." The multiplication in the number and variety of hospitals was a very real problem. In the old days the only reason and justification for hospitals was the charitable desire that poor people should be housed, fed, nursed and doctored during illness. No person who had a house and servants and who could be attended at home would have thought of going to a hospital. Actually hospitals in those prelisterian days were hotbeds of disease and infection. "But since surgery has become a science, and since all manner of investigations are necessary for the diagnosis and treatment of disease, the hospital has become the essential place where all surgical work must be done," continued the lecturer. "It is no longer a question of the man of means being treated at home while the poor man is sent to an institution. Unfortunately, this changed relationship of hospitals to the community has come about so slowly that it is not realized, and there are many even today who do not appreciate its significance. Therefore, we have the present muddle of various types of institutions, provided for the sick, without clear definition of the scope of each or the proper relationship to one another.

"First, there are the voluntary hospitals. In our country it is usual and right to express admiration and gratitude for these voluntary hospitals, which have been the scene of nearly all the advances of discovery and technic. But however sincere may be our admiration for their work in the past, we are bound to criticize their present position and their relationship to the public health service. The voluntary hospital is essentially an institution founded and, to some extent, endowed and wholly managed by private individuals. At one time they were supported entirely by voluntary subscriptions, and the patients were treated free of charge. Now this is all changed. A large proportion of their maintenance charge has to be borne by fees paid by the patients, but in spite of this aid they are all finding it hard to live, while extensions and improvements have to be delayed until some wealthy benefactor can be found to present them with the needed money. To me this has always seemed wrong in principle and bad in practice, and I have always protested against the indignity of medicine being a mendicant. But the essential fault in the voluntary hospital system is the much vaunted independence of control of the voluntary hospitals. The time has come when every hospital which undertakes the treatment of the sick and the investigation of disease must come under public control, for example, that of the Ministry of Health. It should be no longer possible for a private person to give or bequeath a hospital to the community without inquiry by the Ministry of Health as to how that hospital is to be supported, whether it is needed, and, above all, how it is to be staffed. Now that the hospital represents a scientific clinical laboratory in which the work must be highly differentiated and specialized, it is obvious that multiple small hospitals with no connection with one another and no responsibility, except to their own directors, are an absurdity. Uncontrolled independence of voluntary hospitals presents one of the most urgent problems of today. Either the voluntary hospitals must set their own house in order and set up a council of government which shall be concerned only for the good of the community and of scientific progress or else the state must control them. Maintenance must be met by insurance instead of mendicancy, and new hospitals and new buildings must be provided by the public funds."

Professor Hey Groves referred briefly to municipal hospitals in Britain and to nursing homes, of which he said: "Let us hope that the force of circumstances will speed up the disappearance of the proprietary nursing home, which is surely an anachronism today. In the future all the best hospitals should have ample accommodation for private patients who can pay their own fees and maintenance and at the same time obtain the benefit of all the refinements of scientific medicine and surgery."

In the early part of his lecture, which was entitled "The Romance of Surgery," Professor Hey Groves gave an outline of the life and work of Hamilton Russell, who died in Melbourne in 1933. The professor said that Hamilton Russell's innate modesty forbade him to take pride in anything but the fact that he was the pupil and last house surgeon of Lister, whom he ever delighted to honor and to imitate. Professor Hey Groves discussed Russell's saccular theory of hernia, his simple and effective method of treating fractured femurs (known now as the Melbourne method), and his contribution to the surgical technic of treating strictures.

SKIN DISEASES IN AUSTRALIA

Dr. Herman Lawrence of Melbourne stated that the Australian people were more subject to skin diseases than any other people in the world. This was due to the dry atmosphere and the outdoor life of the people. A suggested investigation was the relationship of mice plagues to skin disease.

THE FLYING DOCTORS

Relating the history of the services, Dr. Vickers paid a tribute to Rev. John Flynn, superintendent of the Australian Inland Mission of the Presbyterian church, to whose inspiration and tenacity of purpose they owed these services today. Prior to 1914 he realized the need for medical facilities for the lonely settlers in remote parts and conceived the idea of having a doctor at a central base, with an airplane to visit and, if necessary, transport patients to hospitals. Wireless was essential as a means of communication, and in 1926 a complete transmitting and receiving set was evolved. The power of this type of set was derived from a small high-tension generator driven by bicycle gears, which ensured an unfailing supply of electricity and made the set capable of being operated by anybody. For distances up to 200 miles vocal messages could be sent and received. Outside that radius Morse code was transmitted from a simple typewriter keyboard, which made actual knowledge of Morse unnecessary. There were at present thirty-five of these sets at station homesteads, mission hospitals and police stations, but the objective was to increase that number to 500 as finances permitted. When vocal messages were received the doctor was often able to give simple instructions, particularly in the case of minor ailments of children to worried mothers 200 miles away from medical aid. In urgent cases, such as severe injury or internal operations, the combination of wireless and airplane meant a saving in many cases of days, and patients transported by air were remarkably free from surgical shock inseparable from practically every other form of transport.

The loneliness of Australia's frontiers was unique. Of Australian cities with a population of more than 10,000, all, with few exceptions, were on or near the coast. In difficult medical cases it was necessary to reach a city of 10,000 or more people to guarantee reasonably adequate hospital facilities. The loneliness was likely to continue for some time, as apart from the transcontinental and mining lines no attempt was being made to build railways into the tropical belt. It was desirable not only to convey patients to the hospital by aerial ambulance

but to bring them back when discharged. A patient brought to a hospital in four hours might have to travel over rough country for three weeks to get home.

AUSTRALIA'S FUTURE

"Our moonlight civilization in Australia mirrors most alarmingly the decline in birth rate and population seen in western Europe, for these things act here, not as a safeguard, but toward disaster" declared Sir Raphael Cilento of Queensland at the combined sessions of public medicine and medical sociology. We cannot preserve our frontiers unless we can effectively occupy the land we claim, and the problem is vast. Certainly we have done well in actual figures. During the period 1911-1921 our annual increase corresponded to 2.01 per cent and from 1921 to 1933, in spite of actual loss owing to the depression, it was 1.83 per cent, the chief increase going to Queensland. But, with regard to distribution, Australia is becoming more urbanized without provision in the secondary field. The percentage of population in country districts fell from 37.35 in 1921 to 35.92 in 1933, and this is the tendency of several decades. "It is in respect of natural increase that our figures are most disturbing. From 1861 to 1931, 75.92 per cent of the population was provided by natural increase and 24.08 per cent by immigration. But during the thirty-two years of recorded figures since 1900 this figure has fallen to 19.23 per cent, and from 1927 the figures for the individual years show a decline that resulted in an actual loss in 1930, 1931 and 1932. (Incidentally, the nominated and selected immigrants fell in number from 30,123 in 1927 to 275 in 1931 and 175 in 1932.)

"The Australian birth rate is now one of the lowest in the world, but fortunately the death rate is phenomenally small, so that a reasonably good showing is made in respect of natural increase; but, as Dublin recently pointed out, the natural increase rate is fallacious. In his experience an American rate of 10.99 per thousand when corrected in terms of the biologic constitution (age frequency of material pregnancy and mortality) becomes no more than 5.47 per thousand. This criterion applied to Australian figures by Exley shows several tendencies that are unfavorable. The average age of the population is rising rapidly, and the proportion of youth is declining. The Year Book of 1933 shows that young and middle aged arrivals have fallen from two thirds to little more than one half; the proportion of older people among them has risen from one in seven to one in three; and, in respect of departures from Australia, the depression prompted many people in the age group 15 to 35 to leave Australia for other lands in search of employment. The best of all immigrants, the baby, formerly represented by 3.34 (1911) per family, has fallen to 2.95 (1932), so that the average issue of mothers has fallen 13.22 per cent and there are considerably fewer potential mothers. The natural increase for 1931 was half that of 1891. Exley concluded from his study that, in terms of natural increase, the stable population of Australia, on present figures, would represent no more than 8,500,000 and would contain an excess of females of approximately 35 per thousand. The solution is immigration or ultimate invasion. Australia depends today for her defense and her development on peace and security, for which there is no guaranty. Health—that is, protection against external disease and a vigorous vitality from right living that is internal excellence—and the dominant mentality that goes with abounding health are both essential to ensure our survival in the period of increasing pressure in the Pacific that appears imminent and inevitable."

THE DOCTOR AS EUGENIST

In clear and candid language the principles of eugenics and the aims of the Eugenics Society of Great Britain were explained by Lord Horder, president of the society. Lord Horder said that those who urged the claims of eugenics found themselves for the most part crying in the wilderness, but they believed that the gospel which they preached would usher in an epic in the physical and intellectual progress of the human race which would have comparably good results. Eugenics had been defined as "the study of agencies under social control that might improve or impair the racial qualities of the future generations, either physically or mentally." The eugenist did not believe that permanent results would accrue from pampering the individual. To do one's utmost to start every new life on a sound and sturdy basis was the greatest service one human being could render to another. In medicine there had been a tendency to get back further and further in outlook and in practice. From the cure of the individual patient, medical men had turned to the control of the disease and the increase of the patient's resistance to infection. They called this preventive medicine. They had attended more to the child and less to the adult, and from the child they had passed to the infant and even to prenatal life. But they must go back further still, for, by the time a new individual was conceived, heredity had already stamped on it the power to live healthily or had loaded it with handicaps from which it might never be able to shake itself free. Eugenics in actual fact was the soundest and by far the most profitable form of preventive medicine. Lord Horder suggested that civilization had advanced far enough to enable them to achieve biologic control just as completely as they had achieved physical control. He meant biologic control in the human sphere, since no one seemed to question either the wisdom or the morality of achieving biologic control in the animal and in the plant world. People accepted the principle in relation to horses, cattle and plants but gasped at the idea of accepting the principle in respect of men and women. The principle offended the religious emotions and ideas of some. He did not propose to enter into that arena, for the degree to which a man's religion determined his views on questions of this kind must be settled in the sanctity of his own heart. Supposing the main principle of eugenics to be accepted, the speaker proceeded, what should be done to act on it? In the first place, the study of eugenics should be encouraged in the universities and schools, and by the institution of scholarships and research studentships. Eugenics should be taught to medical students. Then the compilation of family pedigrees should be encouraged.

Marriages

ROBERT D. SCHROCK, Omaha, to Miss Elizabeth Winslow Wetherbee of Newton Highlands, Mass., August 20.

JAMES FRANCIS WILKINSON, Oconomowoc, Wis., to Miss Patricia Phelan Hebert, at Clintonville, August 28.

ALDEN W. SQUIRES, Ann Arbor, Mich., to Miss Marguerite B. Parker of Newton Highlands, Mass., August 5.

HENRY CLAY HARRILL, Ellenboro, N. C., to Miss Maxine Patricia Stout of Pierre, S. D., August 8.

GEORGE ALFRED HESS, Bridgewater, Va., to Miss Helen May Carter of Trenton, N. J., August 18.

JUNIUS RICHARDSON VANN, Spring Hope, N. C., to Miss Matilda Mayo of Clayton in August.

LAWRENCE F. STEFFEN to Miss Aileen Marie Conlan, both of St. Marys, Kan., August 29.

AVISON GANO, Carrollton, Ill., to Miss Maude E. Gronevelt of Muskegon, Mich., August 3.

DONALD F. MARION, Harrisburg, Pa., to Miss Mabel Floyd of Fairmont, N. C., in August.

CLINTON S. M. KOERNER, Chicago, to Miss Rosella Frederick of Rankin, Ill., August 31.

HARRY LINWOOD LEAVITT, Seattle, to Miss Teresa Drumheller of New York, August 22.

FRANCIS LAMBERT MCGANNON to Miss Louise Houck, both of Cleveland, in August.

FRANCIS X. GRAFF, Freeport, Ill., to Miss Constance Ford of Gary, Ind., August 24.

Deaths

Alexander Crever Abbott, Philadelphia; University of Maryland School of Medicine, Baltimore, 1884; emeritus professor of hygiene and bacteriology, University of Pennsylvania School of Medicine; formerly lecturer in hygiene, Johns Hopkins University School of Medicine, Baltimore; member of the Society of American Bacteriologists; for many years member of the city board of health; served during the World War; author of "The Principles of Bacteriology" and "The Hygiene of Transmissible Diseases;" aged 75; died, September 11, at his summer home on Cape Cod, of cerebral hemorrhage.

Richard Clinton Bunting, Memphis, Tenn.; University of Maryland School of Medicine, Baltimore, 1899; member of the Tennessee State Medical Association; formerly clinical assistant, associate and associate professor of neurology, University of Tennessee College of Medicine; on the staffs of the Methodist, St. Joseph's and Crippled Children's hospitals and the Western State Hospital; aged 58; died, September 30, of carcinoma of the pancreas and hemorrhagic pancreatitis.

Henry Schwarz, St. Louis; St. Louis Medical College, 1879; member of the Missouri State Medical Association; professor emeritus of obstetrics and gynecology, Washington University School of Medicine; fellow of the American College of Surgeons; past president of St. Louis Medical Society; aged 79; consulting obstetrician to St. Louis Maternity Hospital and Barnes Hospital, where he died, October 23, of leukemia.

Edward Wells Brown ✠ Northampton, Mass.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1894; medical examiner of Hampshire County for many years; on the staff of the Cooley Dickinson Hospital; consulting surgeon to the Veterans Administration Facility and the Northampton State Hospital; aged 64; died, October 25, of coronary thrombosis.

David Walker Houston ✠ Troy, N. Y.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1881; fellow of the American College of Surgeons; veteran of the Spanish-American War; at one time police surgeon in Cohoes, N. Y., and member of the board of health; consulting surgeon to the Troy and Leonard hospitals; aged 78; died, September 11, of carcinoma of the esophagus.

William Henry Clancy, Cambridge, Mass.; University of the City of New York Medical Department, 1886; member of the Massachusetts Medical Society; for thirty-five years physician for the Cambridge schools; physician for the Middlesex County Jail; on the staffs of the Cambridge City Hospital and the Holy Ghost Hospital; aged 70; died, September 21, of chronic myocarditis.

Frederick Laurence Flynn, New York; Cornell University Medical College, New York, 1902; member of the Medical Society of the State of New York; visiting surgeon to the Morrisania City Hospital; consulting surgeon to the Fordham Hospital and formerly visiting surgeon to the Lincoln Hospital; aged 57; died, October 17, of diabetes mellitus and coronary heart disease.

Edmund Walters Warren, Palatka, Fla.; University of Georgia Medical Department, Augusta, 1902; member, past president and secretary of the Florida Medical Association; secretary of the Putnam County Medical Society; formerly mayor; on the staff of the Mary Lawson Sanatorium; aged 60; died, September 24, in the East Court Hospital, St. Augustine.

William Cohen ✠ Brooklyn; Long Island College Hospital, Brooklyn, 1915; member of the American Academy of Ophthalmology and Oto-Laryngology; assistant visiting ophthalmologist at the Gouverneur Hospital and an assistant in the ophthalmological department of the dispensary of the Long Island College Hospital; aged 45; died, September 10.

George H. Westinghouse, Buffalo; University of Buffalo School of Medicine, 1886; member of the Medical Society of the State of New York; formerly registrar of vital statistics, city board of health; for many years on the staff of the Buffalo Hospital of the Sisters of Charity; aged 74; died, October 8, of coronary thrombosis.

John Breckinridge Catlett, Staunton, Va.; University of Virginia Department of Medicine, Charlottesville, 1888; formerly city physician, member of the board of health and county coroner; for many years on the staff of the King's Daughters' Hospital; aged 69; died, September 24, of malignant disease of the pelvic bones.

Roy Arthur Townsend, Fairgrove, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1910; member of the Michigan State Medical Society; health officer of Fairgrove township; aged 52; died, September 18, in the Unionville (Mich.) Hospital, of nephritis and arteriosclerosis.

William Lewis Conklin ✠ Poughkeepsie, N. Y.; University of the City of New York Medical Department, 1885; past president of the Monroe County Medical Society; on the staff of the Bowne Memorial Hospital, 1923-1925; aged 77; died, October 4, of cardiovascular disease and hypertrophy of the prostate.

Edward William Cooney, Appleton, Wis.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1904; member of the State Medical Society of Wisconsin; on the staff of St. Elizabeth Hospital; aged 61; died, September 11, of coronary thrombosis.

Silas Green Cain, Somerset, Ky.; University of Louisville Medical Department, 1893; member of the Kentucky State Medical Association; served during the World War; on the staff of the Somerset General Hospital; aged 64; was found dead in bed, September 12, of coronary thrombosis.

Lester Blake Cavins ✠ Bloomington, Ill.; Baltimore Medical College, 1904; medical director of the State Farm Life Insurance Company; served during the World War; aged 58; on the staff of the Brokaw Hospital, Normal, where he died, September 28, of coronary thrombosis.

Maria Mitchell Vinton, Brightwaters, N. Y.; Woman's Medical College of the New York Infirmary for Women and Children, New York, 1886; formerly medical inspector of the New York City Health Department; aged 72; died, September 20, of carcinoma of the stomach.

Allen Tindolph Agnew, International Falls, Minn.; University of Minnesota Medical School, Minneapolis, 1917; member of the Minnesota State Medical Association; served during the World War; aged 44; died, September 28, in the Northwestern Hospital, Minneapolis.

John Hamilton Hastie, Stockton, Ala.; University of Tennessee Medical Department, Nashville, 1899; member of the Medical Association of the State of Alabama; aged 57; died in September at an infirmary in Mobile of injuries received when his car crashed into a tree.

Charles David O'Hara, Williamstown, Ky.; Medical College of Ohio, Cincinnati, 1895; member of the Kentucky State Medical Association; past president of the Grant County Medical Society; aged 61; was found dead in his office, September 18, of cerebral hemorrhage.

Thomas R. Barker ✠ Danville, Ind.; Central College of Physicians and Surgeons, Indianapolis, 1901; past president of the Hendricks County Medical Society; for many years on the staff of the Methodist Hospital, Indianapolis; aged 60; died, October 7, of heart disease.

Robert Abbott Donahoe, Lowell, Mass.; University of Vermont College of Medicine, Burlington, 1921; member of the Massachusetts Medical Society; aged 43; on the staff of St. John's Hospital, where he died, August 20, of acute hepatitis and cirrhosis of the liver.

Arthur T. Caine, Anoka, Minn.; University of Minnesota College of Homeopathic Medicine and Surgery, Minneapolis, 1899; medical superintendent of the Anoka State Asylum; aged 60; died, September 12, in the Eitel Hospital, Minneapolis, of cardiac decompensation.

Neil McLeod, Philadelphia; McGill University Faculty of Medicine, Montreal, Que., Canada, 1927; instructor in pathology; University of Pennsylvania School of Medicine; aged 34; was instantly killed, September 23, in an automobile accident near Lakewood, N. J.

Albert Henry Fridenberg, New York; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1877; at various times on the staffs of the Mount Sinai and Beth Israel hospitals; aged 80; died, October 3, of chronic myocarditis.

Spencer C. Alexander, Salt Lick, Ky.; University of Louisville Medical Department, 1890; member of the Kentucky State Medical Association; formerly county coroner; aged 78; died, September 21, in the Good Samaritan Hospital, Lexington, of heart disease.

David James Molumphy ✠ West Hartford, Conn.; Jefferson Medical College of Philadelphia, 1906; for many years medical inspector of the city board of health; on the staff of St. Francis Hospital, Hartford; aged 59; died, August 31, of hypernephroma.

John A. Campbell, Nahunta, Ga.; Medical College of the State of South Carolina, Charleston, 1911; member of the

Medical Association of Georgia; also a druggist; aged 50; died, September 20, in a hospital at Waycross, of gangrenous appendicitis.

Julius Crisler ✠ Jackson, Miss.; Jefferson Medical College of Philadelphia, 1898; past president of the Central Medical Society; fellow of the American College of Surgeons; aged 59; on the staff of the Jackson Infirmary, where he died, September 13.

Hezekiah Levin Martin, Birmingham, Ala.; Vanderbilt University School of Medicine, Nashville, Tenn., 1881; member of the Medical Association of the State of Alabama; Confederate veteran; aged 87; died, September 2, of cardiovascular disease.

John Sullivan Clifford, Rochester, N. Y.; George Washington University School of Medicine, Washington, D. C., 1906; for many years on the staff of St. Mary's Hospital; aged 57; died, September 6, of cerebral hemorrhage and arteriosclerosis.

Abram Burton Jones, Tyrone, Ga.; Atlanta School of Medicine, 1907; member of the Medical Association of Georgia; mayor of Tyrone and member of the board of education; aged 59; died, September 6, of carcinoma of the liver.

Benjamin L. Simmons, Nashville, Tenn.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1890; president of the state board of medical examiners; aged 72; died, September 23, of valvular heart disease and hemiplegia.

George Zina Goodell, Salem, Mass.; Harvard University Medical School, Boston, 1881; member of the Massachusetts Medical Society; formerly on the staff and superintendent of the Salem Hospital; aged 76; died, September 9.

Thomas Joseph Cronin ✠ Worcester, Mass.; Baltimore University School of Medicine, 1898; on the consulting staff of the Fairlawn Hospital; aged 69; died, September 10, in the Memorial Hospital, of carcinoma of the sigmoid.

Abraham A. Pless, Philadelphia; Temple University School of Medicine, Philadelphia, 1918; member of the Medical Society of the State of Pennsylvania; aged 47; died, October 8, in the Mount Sinai Hospital, of lymphatic leukemia.

Harmon Arthur Staley, Schenectady, N. Y.; Albany (N. Y.) Medical College, 1891; member of the Medical Society of the State of New York; aged 70; died, September 21, of cerebral hemorrhage and arteriosclerosis.

David Jacob Hyman, New York; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1895; on the staff of the Beth Israel Hospital; aged 62; died, October 3, of coronary thrombosis.

Oscar Lee Ashby Torbett, Marlin, Texas; Atlanta (Ga.) College of Physicians and Surgeons, 1909; member of the State Medical Association of Texas; aged 60; died, September 13, of agranulocytopenia and septicemia.

Augustus Burt Coolidge, Washington, D. C.; Howard University College of Medicine, Washington, 1884; aged 78; died, September 22, in the Emergency Hospital, of hemorrhagic pancreatitis and right pyonephrosis.

John Eastman Belding, Worcester, Mass.; Harvard University Medical School, Boston, 1902; served during the World War; aged 62; died suddenly, September 16, in Northfield, of coronary occlusion.

Charles Frederick Culley, Cleves, Ohio; Eclectic Medical College, Cincinnati, 1918; aged 41; died, September 2, in the Deaconess Hospital, Cincinnati, of cerebral and pulmonary edema and acute nephritis.

Frank Boogher ✠ St. Louis; University of Virginia Department of Medicine, Charlottesville, 1895; served during the World War; aged 69; died, September 2, in the Barnes Hospital, of heart disease.

John Woodson Gillespie, Sherman, Miss.; Memphis (Tenn.) Hospital Medical College, 1903; member of the Mississippi State Medical Association; aged 61; died, August 24, of coronary thrombosis.

Leonard Charbonneau, Ogdensburg, N. Y.; School of Medicine and Surgery of Montreal, Que., Canada, 1891; aged 72; died suddenly, October 1, in the Hepburn Hospital, of coronary thrombosis.

Charles P. Brown ✠ Oklahoma City, Okla.; University Medical College of Kansas City, Mo., 1900; on the staff of the Oklahoma City General Hospital; aged 68; died, September 13, of heart disease.

George Washington Conterno, New York; Long Island College Hospital, Brooklyn, 1891; aged 66; died, September 9, in the Veterans' Administration Facility, of myocarditis and arteriosclerosis.

Hosea August Vise, Benton, Ill.; St. Louis College of Physicians and Surgeons, 1905; member of the Illinois State Medical Society; aged 52; died, September 16, of carcinoma of the rectum.

Thomas Foster Cleaver, Lebanon, Ky.; University of Louisville Medical Department, 1887; member of the Kentucky State Medical Association; aged 69; died, October 9, of heart disease.

William J. Childress, Greenwood, Ind.; Hospital College of Medicine, Louisville, 1900; aged 61; died, September 5, of pulmonary edema, acute cardiac dilatation and cirrhosis of the liver.

Ernest de Mary Brumback, New York; Hahnemann Medical College and Hospital of Philadelphia, 1899; aged 61; hanged himself, October 2, at his home in White Plains.

John H. Buschemeyer, Louisville, Ky.; University of Louisville Medical Department, 1891; formerly mayor of Louisville; aged 65; died, October 7, of coronary occlusion.

Lyme Harry Blanchard ✠ Oakland, Calif.; University of Vermont College of Medicine, Burlington, 1895; aged 62; died, September 5, of cerebral hemorrhage and myocarditis.

Daniel A. Carlyle, Alba, Mo.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1901; aged 64; died, September 27, of paralysis agitans and arteriosclerosis.

Thomas R. Whitley, Douglasville, Ga.; Atlanta Medical College, 1876; formerly member of the state legislature and mayor of Douglasville; aged 80; died, September 3.

Cicero Minor Nichols, Houston, Texas; Medico-Chirurgical College of Philadelphia, 1899; aged 77; died, July 25, of injuries received when struck by an automobile.

Mary J. Henry Aiton, Summer Hill, Ill.; Northwestern University Woman's Medical School, Chicago, 1901; aged 70, died, September 1, of multiple neuritis.

John Rufus Allen, Healdton, Okla.; Hospital College of Medicine, Louisville, Ky., 1905; aged 54; was found dead, September 18, of cerebral hemorrhage.

Sebastian Stol ✠ Chicago; College of Physicians and Surgeons of Chicago, 1892; aged 66; died, October 27, in St. Elizabeth's Hospital, of coronary sclerosis.

John B. Burford, Rosebud, Texas; Tulane University of Louisiana Medical Department, New Orleans, 1890; aged 70; died, August 15, of diabetes mellitus.

John Calhoun Harris, New Hope, Ala.; Chattanooga (Tenn.) Medical College, 1900; aged 61; died, July 14, in Albertville, of cirrhosis of the liver.

Jay Wesley Hollis, Mullins, S. C.; Lincoln Memorial University Medical Department, Knoxville, 1912; aged 46; died, July 14, in Greenville, of pellagra.

Alfred Harris Abernathy, Erin, Tenn.; Vanderbilt University School of Medicine, Nashville, 1888; aged 72; died, September 17, of heart disease.

Upton Hollifield Kelley, Waynesboro, Ga.; University of Georgia Medical Department, Augusta, 1907; aged 54; died, July 10, of chronic myocarditis.

George W. Wallage, Middletown, Ind.; Medical College of Indiana, Indianapolis, 1895; aged 69; died, September 4, of acute dilatation of the heart.

Samuel Martin Fraser, Westmount, Que., Canada; Western University Faculty of Medicine, London, Ont., 1889; aged 65; died, August 31.

Lewis A. Thomason, Texarkana, Ark.; Memphis (Tenn.) Hospital Medical College, 1894; aged 78; died, July 10, of heart disease.

James Edward Hanna, Ottawa, Ont., Canada; Queen's University Faculty of Medicine, Kingston, 1886; aged 74; died, August 30.

Hartley Orin Baker, Los Angeles; Denver and Gross College of Medicine, 1906; aged 65; died, September 28, of heart disease.

Pink Howe Howard, St. Louis; St. Louis College of Physicians and Surgeons, 1914; aged 49; died, September 7, of heart disease.

John L. Cox, Lyons, Ind.; Hospital College of Medicine, Louisville, 1898; aged 74; died, August 25, of arteriosclerosis.

William Marcus Lee, Fair Oaks, Calif.; St. Louis University School of Medicine, 1927; aged 31; died, August 5.

Joseph L. Russell, Chicago; Jenner Medical College, Chicago, 1902; aged 65; died, October 28, of carcinoma.

William Cannon Kennedy, New York; Missouri Medical College, St. Louis, 1880; aged 79; died, September 13.

Bureau of Investigation

NEW SCIENCE INSTITUTE

A Fraudulent Rupture Cure Debarred from the Mails

For some years one John G. Homan of Steubenville, Ohio, has been a mail-order quack. He is not a physician, a pharmacist or a chemist, yet he has put out pieces of quackery that have been sold under the implied claims that they would cure "prostate trouble" and rupture. In the prostate field Homan has operated under the name of "Electro Thermal Company," which puts out a device that is essentially a rectal dilator with a thermostat attachment that permits the device, when placed in the rectum, to have its temperature raised by the electric current. In the same field Homan has also operated under the trade name "Harmless Remedy Company," which put out, among other things, a rectal suppository containing a mixture of substances which, when a small amount of water was added to them, would generate heat.

In the "rupture cure" field he has done business under the trade name "New Science Institute," which put out a truss that was sold under the claim that it was not a truss and to which has been given such fancy names as "Magic Dot," "Suction-Cell," "New Science Retainer," etc.

In 1929 the Federal Trade Commission issued a complaint against John G. Homan, connected with his New Science Institute quackery. After an extended hearing, the Federal Trade Commission issued a Cease and Desist Order in November 1931. Under this Homan was ordered to cease exaggerating the value of his so-called system and disparaging the products or methods of treatment offered by competitors. He was ordered to cease alleging that by the use of his device, the so-called Magic Dot, every reducible rupture could be supported or cured in a considerable proportion of the cases.

Homan evaded the orders of the Federal Trade Commission, by the usual advertising method of lying by implication instead of directly. As Homan's quackeries have always been carried on through the agency of the United States mails, the Post Office Department turned its attention to him in connection with the rupture-cure fake. In November 1934 the New Science Institute and John G. Homan were called upon to show cause why a fraud order should not be issued against them. A hearing which lasted three and a half days was held in January 1935, at the conclusion of which Homan and his so-called Institute were granted three weeks in which to submit a brief. Following the submission of the brief, the Hon. Karl A. Crowley, Solicitor for the Post Office Department, carefully reviewed all of the evidence in the case and summed it up in an extensive memorandum addressed to the Postmaster General. From the Solicitor's memorandum and the files of the Bureau of Investigation, the following data have been obtained:

The New Science Institute was a trade name used by John G. Homan and his wife, operating as partners. It was started originally as a department of Homan's prostate-cure quackery and operations were begun under the name of New Science Institute in 1923. Homan has advertised extensively, and the files of the Bureau of Investigation of the American Medical Association contain large display advertisements from the following newspapers and magazines that have appeared at one time or another during the period that the New Science Institute has operated. Among the newspapers that have carried New Science Institute advertisements were the following: Chicago *Herald and Examiner*, *Daily Times*, Chicago, *Democrat and Chronicle*, Rochester (N. Y.), *Daily Times*, Davenport, Iowa, *Illinois States Register* and Toledo *News-Bee*. Some of the magazines that sold space to this piece of quackery were *Physical Culture*, *Popular Mechanics*, *Real Detective*, *Pathfinder*, *Psychology*, *Strength*, *Real America*, *Shrine Magazine*, *Kiwanis Magazine*, *Modern Woodman Magazine*, and *Modern Living*.

The advertisements were invariably illustrated, many of them showing women in bathing suits doing acrobatic stunts, and implying that the women were ruptured but could do these tricks because they wore Homan's device. At the hearing Homan admitted that the persons shown in such advertisements were professional models and that he had no knowledge of whether or not they were ruptured or were, in fact, using any appliance.

Beware the Small Rupture that 'Doesn't Bother Much'
Light as a Feather
Yet ... Holds Rupture!
PERSONAL GUARANTY
NEW SCIENCE INSTITUTE

Reproduction (greatly reduced) of a full-page advertisement that appeared in *Kiwanis Magazine*, September 1932.

In common with all mail-order quacks, Homan published testimonials. He prefaced the publication of such testimonials with the statement that they were "representations of the writers of them and not us." As Solicitor Crowley pointed out, although the New Science Institute attempted to escape responsibility for publishing these testimonials by stating that they were representations of the writers, the printing of them was manifestly designed to, and did actually, convey the impression that the purchasers of the Magic Dot or the Suction Retainer, or whatever name the piece of quackery happened to go by at that time, would secure the curative and other results claimed to have been obtained by the testimonial writers. Homan also admitted during the hearing that he had unfavorable letters from persons who had bought his device, and when asked why he did not publish any of these, replied: "That would be foolish."

While Homan declared at the hearing that his appliances were sold for "reducible" ruptures only, he admitted on questioning that they were actually furnished in cases in which the question of reducibility was undetermined, and evidence was submitted to show that the device was sold in one instance to a person who described his hernia as being as large as a goose egg!

The New Science Retainer, as Homan's device was called more latterly, was a flat, circular, rubber pad having about the approximate circumference of a silver dollar; it was about three-quarters of an inch thick and had a number of shallow indentations on its surface. Although Homan's advertising claimed that his appliance worked without belts, the New Science Retainer actually had attached to its outer surface a catch for the express purpose of enabling it to be attached to

a belt to which Homan gave the name "Duogirdle." In spite of this, Homan represented, iterated and reiterated throughout his advertising that belts and leg straps were unnecessary in connection with the utilization of his so-called system.

Much was made by Homan in his advertising of what he called "Seaver Essentials," which was said to be the adoption of a method of treatment by which Dr. J. W. Seaver of "a great Eastern University" was alleged to have cured seven out of ten persons of rupture. These so-called Seaver Essentials were furnished by Homan in a booklet entitled "How to Aid Nature in Rupture—Quickly." They consisted merely of descriptions of a number of movements of the arms, legs and torso, including instructions for the massage of the area surrounding the rupture, and advice for the relief of constipation. It appeared that Homan appropriated the so-called Seaver Method from an old textbook. There *was* a Dr. J. W. Seaver who forty years ago was associate director of Yale University gymnasium; he died twenty years ago. A physician who had been associated with Dr. Seaver during his connection with the gymnasium furnished the Post Office Department with some facts in the matter. It appears that Dr. Seaver carried on some emergency medical oversight in a few students, among whom some few cases of rupture were noted, and, not being satisfied with the available trusses, the doctor devised a rubber attachment of his own and, in collaboration with his associates, also arranged a series of safe exercises. Dr. Seaver's associate stated that the doctor never cured seven out of ten cases of rupture, as Homan had claimed, and that it was doubtful if he had, in fact, ever cured a single case. It was further shown that the brochure written by Dr. Seaver was hopelessly outdated, a view that was substantiated by medical expert testimony adduced by the government at the hearing.

It was brought out at the hearing, also, that no physicians were employed by the New Science Institute, and even a so-called truss fitter that was employed by the New Science Institute admitted during the course of testimony that he was quite unable to answer questions of a medical nature with respect to rupture. Homan's own attorney also had to concede that a number of answers given by Homan himself to similar questions were erroneous.

Aside from the quackery involved in the sale of Homan's device, there was also commercial trickery. The Solicitor for the Post Office Department stated that it was proved that it was the established practice of the New Science Institute to send the so-called free Activator Model and leg strap in a separate package so sealed as to prevent a trial or even a complete examination. Then there was printed on the outside of the wrapper a warning to the effect that the contents could not be returned if the seal was broken, but there was a careful avoidance of any statement that such breaking of the seal would result in the loss of the right of refund. It was shown in a number of cases that many persons who had purchased the so-called System and found both the sealed and unsealed portion thereof unsatisfactory were denied the return of their money on the ground that they had broken their "contract." In fact, Homan admitted at the hearing that his concern endeavored to escape making refunds whenever possible, and he also admitted that it was probably true that the statements in his literature were calculated to induce patrons to open the sealed packages. It was brought out, further, at the hearing that Homan had a "stool-pigeon" described in the quack literature as "Herbert Ayers, Box 402, Wheeling, W. Va." Homan, when questioned, could not say who Herbert Ayers was. The postmaster at Wheeling, W. Va., however, reported that Box 402 was rented by one Carl Schumann, who was an employee of the New Science Institute.

The government had no difficulty in showing that the claim that the Homan device would cure rupture was false and fraudulent. Mr. Crowley closes his memorandum to the Postmaster General with the statement that he recommended that a fraud order be issued against the New Science Institute and its officers and agents as such. The Postmaster General notified the postmaster at Steubenville, Ohio, to return all letters and other mail matter that came addressed to the New Science Institute to the senders with the word "Fraudulent" plainly written or stamped on the outside of such letters. The order went into effect April 25, 1935.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted on request.

STITCH ABSCESS—FOOD PRESERVATIVES—AUTOGENOUS VACCINE

To the Editor:—Would you kindly give: 1. The correct treatment of a "stitch abscess" according to various stages. 2. Names and dosages of several food preservatives. 3. Practical method of preparing an autogenous vaccine from a pustule and a pathologic urine. Please omit name.

M.D., Michigan.

ANSWER.—1. A stitch abscess is one arising round or limited to the region of a suture. The term is used in most hospitals improperly to cover any infection of a wound. In the early stages there may be some redness round the approximating stitches of a wound. If examined microscopically, a small abscess probably could be demonstrated round the stitch. Most of these stitch infections terminate with little gross suppuration, and healing is prompt after removal of the stitches. As soon as redness is noted round skin sutures, warm moist compresses of boric solution should be applied. Usually the stitches that are most involved, especially if interrupted in type, should be removed. If the infection has progressed to the stage of gross abscess about the sutures, the same treatment will usually be satisfactory, as the pus usually drains out through suture holes. In other instances the infection has spread from the stitches to the edges of the wound with the development of free pus between them. The skin may look perfectly healed on the surface, with little redness, or there may be considerable inflammation with induration about the wound. Warm boric compresses should be applied if there is considerable induration without free pus. When free pus can be demonstrated or is suspected, the edges of the skin should be separated by a sterile probe and if pus is present it may be drained by the removal of a few stitches. If there tends to be a pocket, a small rubber drain may be inserted or the superficial tissues opened widely. In the presence of any infection of a wound there is usually delayed healing of all the tissues with great danger of separation of the wound because of early digestion of the catgut sutures. Wide tension sutures should always be used and adhesive straps applied to bridge the wound on the removal of any sutures to prevent hernia or evisceration.

2. The bureau of chemistry of the U. S. Department of Agriculture determines the use of any substance used as a food preservative. Inquiry and access to bulletins should give further information than can be given here. Probably the most important preservative is sodium benzoate. Under President Theodore Roosevelt a board of consulting experts from three universities studied the effects of sodium benzoate on man under careful experimental conditions. They all concluded essentially that sodium benzoate in small doses (under 0.5 Gm. daily) mixed with food was without deleterious or poisonous action and is not injurious to health, sodium benzoate in large doses (up to 4 Gm. daily) was found not to be injurious to health, and the admixture of sodium benzoate with food in small or large doses was found not to affect injuriously or impair the quality or nutritive value of such food. The secretary of agriculture ruled that sodium benzoate was permissible for use as a preservative of food if so stated on the label. Manufacturers of food products which in their view require the use of a preservative are in general content with 0.1 per cent of sodium benzoate. In eating such a preserved food the consumer would need to take 300 Gm. daily, or nearly two thirds of a pound, to ingest an amount of sodium benzoate equal to the minimal dose of 0.3 Gm. daily used in the experiments on man. The large doses given to human subjects ranged from 0.6 Gm. to 4 Gm. daily over one month and even larger doses were given. The chief objection to the use of chemical preservatives is that their addition makes it easier to use inferior or partially spoiled raw materials and it prevents the natural fermentation and spoilage following insanitary conditions of handling food. The use of sulphur dioxide, copper sulphate, alum, gluside, borax or borates has been referred to the board, whose further reports were not available.

3. In the preparation of autogenous vaccine, the bacteria must be obtained without contamination. The surface of a pustule may be seared with a hot instrument or cleaned with an antiseptic solution that evaporates quickly, such as alcohol. The pustule is lanced or a sterile needle inserted and the pus obtained for growth. A specimen of urine must be obtained by catheterization after surgical cleansing of the field, by means of sterile instruments. Suitable mediums are inoculated and after growth

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the bacteria are washed off in salt solution. They may be standardized by means of the Hopkins calibrated vaccine centrifuge tube. After centrifugation the salt solution is largely removed and the bacteria are suspended in 1:1,000 merthiolate solution. They are placed in an incubator from four to six days and then tested for sterility. They are diluted as desired, usually from 100 million to 1 billion to a cubic centimeter for clinical use. An older method was to wash off the bacteria in salt solution and kill by heating to 57 C. for half an hour. Bacteria may be counted directly with a hemocytometer, with the use of a dilute aniline dye such as an alcoholic solution of methylene blue. The bacterial suspension may be mixed with blood corpuscles and, after counting, their number may be estimated by determining the ratio between them. After standardization, they may be preserved in salt solution to which 0.5 per cent of phenol (carbolic acid) is added.

PANCREATIC EXTRACT IN CLAUDICATION

To the Editor:—In Queries and Minor Notes in THE JOURNAL, March 23, you mention a pancreatic extract, insulin free, used in claudication. I have been unable to get any information from New York dealers in reference to this product. Can you tell me where it may be obtained?

EDWARD S. NEWELL, M.D., Pelham Manor, N. Y.

ANSWER.—Various tissue and urine extracts have been used in intermittent claudication. Intramuscular administration has been effective in some cases with the active extracts. Two pancreatic extracts are now available. The extract isolated by Frey and Kraut from urine was first called kallikrein, later padutin. A preparation called padutin is now made from pancreas and can be obtained from the Winthrop Chemical Company, New York. Pancreatic Tissue Extract No. 568, produced by Sharp and Dohme, Baltimore, has been used effectively in some cases. More recently an active principle has been found in other tissues. Several skeletal muscle extracts have been reported to be useful; namely, Myoston and MAP (muscle adenosin phosphoric acid) prepared by Dr. Henning of Berlin. A tissue extract said to be equally effective is Heart Muscle Extract, prepared by Eli Lilly Company in Indianapolis. These extracts are entirely in an experimental stage. They have not been accepted by the Council on Pharmacy and Chemistry of the American Medical Association. Controlled clinical trials have indicated that the active principle or principles of these extracts affects the pain of contracting muscle in the presence of a diminished blood supply. It is not certain that the active principle is the same in all cases and it appears that the principle or principles of these preparations may not properly be considered hormones.

THE POLARITY OF CHEST LEADS

To the Editor:—Probably many physicians have wondered why electrocardiograms made by chest leads appear to be upside down, P, R and T of normal records all inverted and S alone upright. The answer is that some one started making them that way and others have followed the lead. If the first news reel showing Chinese scenes had been exhibited upside down because the producer thought that would insure recognition of the part of the earth portrayed, it is not unlikely that all subsequent films from the antipodes would, by force of cinema convention, necessarily be shown in the same confusing fashion. For myself, I prefer to see a normal P, R or T wave, made by any derivation, erect and healthy looking. Made by the inverse polarity, they look sick. In spite of some criticism on the score of unconventionality I have insisted, in my own hospital service, on the use of the normal polarity. Until recently, however, it had not seemed to me a very serious matter, for physicians, as well as dentists, can interpret a mirror image. But now, I observe, it is becoming customary to call the initial downward ventricular deflection a Q wave. This is serious confusion, for the large downward deflection is unquestionably an R wave upside down; the true Q wave is usually entirely lacking. But, if present, what shall it be called? Since chest leads have been in use for only a relatively short time the pattern of these deflections has not yet become stereotyped in the medical mind, as is the case with the standard leads. It is therefore not too late to reform. The obliging quartz fiber will deflect as willingly the other way if one will only interchange the lead wires.

FREDERICK H. HOWARD, M.D., New York.

ANSWER.—Many have had the same reaction as that expressed in this communication to the introduction of the inverted complexes P, QRS and T waves in the precordial lead commonly called lead 4 in normal individuals. Doubtless some have been on the verge of initiating a campaign similar to that suggested here to reverse the lead points so that the chest lead will be normally composed of upright P, QRS and T waves, but later reflection has made it seem desirable to retain the precordial lead or lead 4 as proposed by several of those originally urging its routine adoption, the chief reason for this change of view being that, as commonly taken now, lead 4 is easily distinguished from the other leads, and since it is a newly introduced lead it is well to have it readily distinguished from the other three. Practice makes one quite familiar with the inverted complexes, and after the original irritation produced by seeing the upside down waves has passed one becomes content even with the appearance of the curve. Furthermore, so much has already been written during the last year or two about lead 4 as ordinarily taken that it would create a considerable bother and confusion to make the change.

However, the criticism with reference to the nomenclature of the QRS wave is pertinent. As stated, the Q is really not a Q but an inverted R, and the R is not an R wave but an upright S. The same criticism holds for the nomenclature of the QRS waves in the ordinary leads, and this was emphasized in a recent paper by Sylvester McGinn and P. D. White (The Duration of the QRS Complex in the Normal and in the Abnormal Electrocardiogram, *Am. Heart J.* **9**:642 [June] 1934). McGinn and White have suggested a way out of the difficulty in their note on nomenclature at the end of the paper. They have advised that a more satisfactory method of describing the QRS complex would be to state positive and negative deflections by appropriate signs with amplitudes expressed in millimeters; thus QRS might equal —2, +12, —5, without Q, R and S being specified separately. The same procedure could easily be applied to lead 4.

RUGGLES' CREAM

To the Editor:—Can you find for me in some of the formularies available in your office the composition of so-called Ruggles' Cream, a mixture used on the hands?

M.D., Chicago.

ANSWER.—The A. M. A. Chemical Laboratory inquired of Melvin & Badger Company, the manufacturers of this cream, whether or not the product was secret in composition, and if not, what was the quantitative statement of ingredients. The firm replied:

"The Melvin & Badger Company Ruggles Cream Formulae was originated by this Company for Dr. Ruggles of Rochester, New York and Dr. Charles J. White of Boston, and we do not feel disposed to furnish the composition to anyone."

Inquiry was then made of Dr. E. Wood Ruggles, who has kindly supplied the following information:

"In reply to your communication to me regarding the Ruggles Cream I wish to state most emphatically that I have never received one penny of compensation from any firm engaged in making it. I presume the Melvin & Badger Company prefer to keep the working formula to themselves as they sell a great deal of the cream, which they explain by saying that no other drug firm has been able to manufacture the cream as it should be done. Or perhaps they thought no one should have the formula without obtaining it directly from me.

"I published the working formula in the *Archives of Dermatology and Syphilology* some years ago and firms in various cities make a very fair cream. Most of them will not take pains to have the three component parts at exactly the same temperature when mixing them. I take pleasure in enclosing the formula used by the . . . Company in this city and shall be glad to have you send it to any inquiring physicians or pharmacists, always warning them that it is extremely difficult to manufacture properly.

"I think I should add that it would be well to write any one inquiring about the formula that they should only have it manufactured by an especially fine pharmacist and one who takes pride in his work. Otherwise it will be a failure."

The formula supplied by Dr. Ruggles is as follows:

	Gm. or Cc.
Powdered stearic acid	75
Potassium carbonate	15
Distilled water	320
Powdered borax	5
Quince jelly	75
Distilled water	100
Powdered zinc oxide	10
Glycerite starch	400

"Melt the stearic acid. At the same time dissolve the potassium carbonate in 320 cc. of distilled water and heat to about 170 F. on water bath. Bring stearic acid to the same temperature and mix them. Continue this temperature on the water bath, with occasional stirring, until the reaction is perfectly complete.

"Dissolve the powdered borax in 100 cc. of distilled water, add the quince jelly and heat on water bath to about 170 F. Add this mixture to the first, which should be at the same temperature, and again leave on water bath until reaction is complete.

"Heat the glycerite of starch to the same temperature, stir in the powdered zinc oxide with a glass stirring rod and add to the other mixture, stirring occasionally.

"Let cool and add perfume (Oil Ylang Ylang recommended).

"The most important essential is to employ a perfect glycerite of starch. Use Kinkford's or other suitable grade of corn starch and U. S. P. Glycerin and make it up fresh for each batch.

"Also essential is to have all three batches at exactly the same temperature when mixing them."

POSSIBLE LEAD POISONING

To the Editor:—May I take the liberty of asking your opinion concerning a case of suspected lead poisoning which recently came under my care. Briefly, the case is as follows: A man, aged 32, a Mexican, employed for ten years as a sprayer (using black paint said to contain no lead) and for the past two and one-half years as an enameler (enamel containing "frit"—ground glass—in which is found a certain amount of lead—about 27 per cent according to report), enjoyed good health and had never been ill or had an acute infection of any kind and his family and marital histories were negative. During the past two years he had complained of occasional headache, usually frontal, and in the last two weeks of his employment these headaches became so severe that he was obliged to quit work. In addition he complained of vertigo, blurring of vision, weakness, anorexia and vomiting, loss of weight and a recent nocturia. There was no history or stigmas of syphilis, and the Wassermann reaction was negative. On examination he was found to be in a state of fairly good nourishment but appeared pale (noticeable even with the dark skin). He was found to present most of the elements of a chronic nephritis with hypertension and evidence of albuminuric retinopathy, the picture of a so-called malignant hypertension, and within ten weeks the patient died after presenting for a week the picture of uremic poisoning. The blood pressure on first examination was 206 systolic, 150 diastolic. The urine always contained much albumin and some casts, hyaline and granular, with occasionally a few red blood cells. The specific gravity was usually about 1.010. The first quantitative lead determination on the urine (taken about three weeks after the last day of exposure to this metal while at work) showed an excretion of 0.17 mg. to 1,500 cc., or about 0.12 mg. per liter. After three days on a "deleading" regimen, urine was again collected for twenty-four hours and showed an excretion of 0.202 mg. per liter, or nearly double the former reading. After an interim of about six weeks on a regular diet (in which calcium had not been restricted) the excretion was a little more than 0.12 mg. per liter and this was the last such test made. No test was made of the lead content of the feces or blood serum. The patient presented practically none of the so-called classic symptoms of chronic plumbism. There was at first no anemia, although all subsequent blood counts disclosed a moderate anemia and at no time was there stippling observed. A reticulocyte count was not made. There was no "lead line" in the gums, but neither was there any pyorrhea or carious teeth clinically or roentgenographically. There were at no time symptoms of colic or of marked constipation, and no palsies were noted. The deep reflexes were increased, however, and toward the close there were muscular twitchings and protracted hiccuping. Vomiting was quite a prominent symptom throughout, and headache, chiefly frontal and suboccipital, was almost constant and frequently severe. There was complaint of some muscle pain in the extremities, but no evidence of muscular weakness or palsy. He had no convulsions and was never in deep coma, although he was semicomatose during the last two days. I trust that I have not omitted anything of great importance in this brief history of the case.

The question that arises specifically in my mind and concerning which your opinion would be greatly appreciated is this: In the absence of a history of any acute infection, in the absence of any demonstrable foci of infection in teeth, tonsils, sinuses or prostate, in the absence of a familial history of hypertensive disease, with a history of contact with lead over a period of several years, with an onset of ill health dating back only two years but not disabling until a month or two preceding his gradual demise, and with the rather meager observations suggesting chronic plumbism;

1. Could this be a case of chronic plumbism?
2. Is it likely that it was chronic plumbism?
3. Is it feasible that a so-called normal person not in intimate contact with lead could:
   (*a*) Show the amount of lead excretion found in this case (0.12 plus mg. per liter of urine)?
   (*b*) Show an increase such as this (0.202 mg. per liter) after a few days on a "deleading" regimen? (Note: In addition to the restricted calcium diet, the patient was given phosphoric acid by mouth but vomited after nearly each dose, so ammonium chloride was substituted, and viosterol was also given orally.)
4. Have you knowledge of patients who have died of chronic plumbism who have shown no greater amounts of lead excretion in the urine than this case did?

I shall truly be grateful to you for an expression of your opinion in this matter.

P. K. EDMUNDS, M.D., Los Angeles.

ANSWER.—The question that this communication propounds is essentially as follows: Can a small exposure to lead account for a malignant hypertension and prompt death from kidney insufficiency? That lead causes nephritis is often suggested in the literature, but the evidence for this is not satisfactory. There are two investigations that are suggestive. Workers with Blair Bell noted a small quantity of albumin and casts after the injection of lead intravenously. This was given for the treatment of cancer. This was an evidence of small kidney damage in spite of flooding the organism with lead. Dr. L. J. J. Nye published an article (*M. J. Australia* 2:145 [Aug. 3] 1929) which showed that children who had had lead poisoning had a high incidence of chronic nephritis.

The patient described in the query had an excretion of lead slightly greater than so-called normal. This indicated that he had absorbed a little more lead than the normal individual, but without evidence in the blood or other signs it would be difficult to make the diagnosis of lead poisoning. One may well make the diagnosis of lead absorption, but to link the severe renal damage to chronic plumbism would hardly seem justifiable. There is no record of a patient dying of chronic plumbism who did not show greater amounts of lead excretion than this patient showed.

PAIN IN SHIN BONES AND CIRCULATORY DISTURBANCE IN LEGS

To the Editor:—Could you suggest a diagnosis or further studies to be carried out on the following case in order to establish a diagnosis? A woman, aged 70 complains of "pain in the shin bones." The trouble started about five years ago and was at first intermittent but has now progressed to the point where the pain is constant and at times very severe. It is characterized as a dull ache in both tibias, extending from the ankles to the knees. The pain is not related in any way to exercise or physical activity. The feet and toes are cold. The greatest relief is obtained by putting the legs in hot water. Physical examination is negative. The sinus, teeth and mouth are normal. The heart is normal, and the blood pressure is 154 systolic, 74 diastolic. The lungs are clear, the abdomen is normal, and the liver and spleen are not enlarged. The reflexes are equal and hyperactive. There is a normal plantar reflex and a good pulse in both dorsalis pedis, and posterior tibial arteries. There is moderate sclerosis of the brachial arteries. The plantar arches are normal. Roentgenograms of the legs are negative and the arteries cannot be seen. The Wassermann reaction is negative. Examination of the blood reveals: hemoglobin, 102 per cent (Sahli); red blood cells, 4,450,000; differential, 52 per cent; polymorphonuclear leukocytes, 39 per cent; lymphocytes, 2 per cent; eosinophils, 3 per cent; basophils, 4 per cent transitional. Examination of the urine is negative; basal metabolism is —8 per cent. The patient has a stable nervous system and the trouble is not imaginary. Any suggestions as to diagnosis or treatment will be appreciated. Please omit name. M.D., New York.

ANSWER.—The diagnosis in this case is difficult. The coldness of the feet would suggest a circulatory disturbance, but the fact that the arteries in the feet pulsate freely would probably rule out Buerger's disease (thrombo-angiitis obliterans). The pain in the tibias would suggest a beginning Paget's osteitis deformans, but the roentgen evidence seems to be lacking. Osteosclerosis (Albers-Schoenberg), or its opposite, acute bone atrophy, can usually be determined by roentgen examination.

The state of circulation in the feet should be determined by the rate of heat loss, the surface temperature, and the tests for capillary sufficiency. The sclerosis of the brachial arteries suggests a similar change in the arteries of the leg.

Thick woolen stockings should be worn, and diathermy should be used on both legs. Large quantities of water should be drunk daily, and a low protein diet should be enforced.

RENAL GLYCOSURIA

To the Editor:—A white woman, aged 48, came to me complaining of a loss of 10 pounds (4.5 Kg.) during the three months preceding her visit, nervousness, fatigue and irritability. There was a history of occasional episodes of spastic colitis over a five year period, the last attack occurring in March 1935. Physical examination, including fluoroscopy and proctoscopy, was negative. The red blood cell count and hemoglobin were within normal limits. The Wassermann test was negative. The basal metabolic rate was plus four. The only positive finding was a two plus urinary sugar. The fasting blood sugar was 104 mg. per hundred cubic centimeters of blood. A sugar tolerance test was done and found to be normal. The patient has been on a diet of 150 Gm. of carbohydrate and 80 Gm. of fat for the past two weeks and has continued to spill from one plus to two plus sugar in specimens taken two hours after meals. The urin. y sugar is dextrose. Will you kindly advise me on the following: 1. Am I correct in calling this a case of renal glycosuria? 2. What is the dietetic management of renal glycosuria? 3. What other conditions might be considered in a differential diagnosis? 4. What is the prognosis as regards the appearance of diabetes mellitus in a patient with renal glycosuria? Kindly omit name and address.

M.D., New Jersey.

ANSWER.—1. If the blood sugar determinations made in the sugar tolerance test were reliable, this case is probably one of renal glycosuria.

2. Patients with true renal glycosuria are usually not benefited by dietary restrictions. They require no treatment.

3. Other possibilities are that the reducing substance in the urine is something other than dextrose. Fructosuria, pentosuria, galactosuria, glycuronic acid and homogentisic acid should be considered. The identification of dextrose depends on a positive fermentation test and dextrorotation in the polaroscope. The methods for identifying other reducing substances in the urine can be found in the manuals of clinical diagnosis.

4. The experience of Powelson and Wilder (Powelson, H. C., and Wilder, R. M.: Innocent Glycosuria, THE JOURNAL, May 9, 1931, p. 1562) with eighty-two cases of renal glycosuria followed for a long period did not indicate any instance of the development of true diabetes mellitus. The prognosis in renal glycosuria is apparently entirely benign.

MAMMARY TUMOR IN MALE

To the Editor:—A married man, aged 33, weighing 170 pounds (77.1 Kg.), consulted me about pain in the right breast. He states that he first noted this about two years ago when he had gained about 30 pounds (13.6 Kg.), and since then when somebody accidentally touches him, or if he brushes against something, he notices the pain. Otherwise the pain is not noticeable. The past history is essentially negative; he states that his breasts were always larger than other boys', and this was called to his attention on numerous occasions. Both parents are living and well; he has two sisters and a brother, apparently healthy. A thorough physical examination, including urinalysis and blood examination, was negative, with the exception of the right breast, which revealed a well padded male mamma, slightly larger than the left; it is freely movable with no retraction of the nipple and no enlargement of the axillary nodes. Pressure on the nipple causes a pain, but not elsewhere. There is palpable beneath the nipple in the substance of the breast a firm, circular area of induration; however, a similar but smaller induration, nonpainful, can be palpated in the left breast. Local anodyne applications are of no avail. He is getting worried for fear the pain is due to a malignant condition. Your suggestions as to the probable cause and treatment would be greatly appreciated. Kindly omit name.

M.D., Illinois.

ANSWER.—The first thing is to ascertain whether there is not a tumor of the testicle. Teratoma in this region may cause enlargement of the breast. If not, an exploratory operation should be done, for while it is probable that only a fibroadenoma is present—the youth of the patient being strongly in favor of a benign hyperplasia—the mortality from carcinoma of the male breast is so high that no mammary tumor which persists more than a few weeks should remain without investigation.

RENAL COLIC AND INFECTION

To the Editor:—A white man, aged 30, had an attack of renal colic in August 1933. He passed several stones subsequently, after which cystoscopy was done. At this time the pelves were not dilated, and kidney function was excellent. The renal function and general health remained excellent until April 1935, at which time the patient suffered a single attack of colic. At this time a flat plate revealed two stones in the course of the right ureter. To date the patient has been comfortable and has passed no stone. What is the advisability and advantage of having cystoscopy done again in this case? Please omit name and address.

M.D., New Jersey.

ANSWER.—In view of the fact that this patient has no symptoms, a policy of watchful waiting is justified as long as the urine remains free from infection.

If, however, the patient again has an attack of renal colic, the urine shows infection, and a repeated roentgen examination shows no movement of the stones, or if the pyelograms show dilatation with perhaps suspension of function in the kidney, it is advisable to pass the cystoscope again, dilate the ureter with bougies and inject sterile oil into the ureter to aid in moving the stones down the ureter.

TRAUMA AND EPIDIDYMITIS

To the Editor:—In Queries and Minor Notes in THE JOURNAL, May 4, page 1659, I note your answer to the questioner from Pennsylvania. "Trauma may be an exciting cause of an acute attack of nongonorrheal epididymitis in a person who gives no history of a gonorrheal infection." Would it not be well to state this answer so as to rule out "strain"? I can conceive of a direct trauma being able to cause a localization or recrudescence of a latent disease, but so frequently "lifting" is given as a traumatic etiology that I think it well to be specific. See article by Miley B. Wesson in THE JOURNAL, Dec. 15, 1928, page 1857.

C. F. N. SCHRAM, M.D., Kingsport, Tenn.

ANSWER.—The question of strain, such as straining at stool or heavy lifting, does play a part as an exciting cause in acute epididymitis, whether gonorrheal or nongonorrheal. This was included in the term "trauma."

BURNING PAIN AND BLOOD CIRCULATION IN MOUTH

To the Editor:—Can you tell me the cause and remedy for burning in the mouth and throat which is relieved by removing false teeth? Both of my patients with this condition are rather nervous types. One has even had a gold plate made, but to no effect. The reaction of the saliva to litmus is alkaline. Urine examinations are negative. No blood work has been done. The sets of teeth of the two patients were made by different dentists. Both sets apparently fit well, and one patient has had three sets. Please omit name and address.

M.D., Pennsylvania.

ANSWER.—Almost without exception, this burning is caused by an impaired blood supply, due to the pressure of the dentures over the anterior and posterior palatine foramina. Relief should be made in the impressions before the dentures are made. It might be possible to relieve these areas on the dentures that the patients are now wearing, but ordinarily it is difficult to make sufficient relief to eliminate the burning.

Medical Examinations and Licensure

COMING EXAMINATIONS

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOGY: *Written examination for Group B applicants* will be held in various cities throughout the country, March 14. *Oral examination for Group A and B applicants* will be held in Kansas City, Mo., May 11-12. *Applications for written examination should be filed with the secretary before Jan. 15.* Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: Written examination and review of case histories of Group B applicants will be held in various cities of the United States and Canada, Dec. 7. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY: St. Louis, Nov. 18. Asst. Sec., Dr. Thomas D. Allen, 122 S. Michigan Ave., Chicago.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: St. Louis, Jan. Sec., Dr. Fremont A. Chandler, 180 N. Michigan Ave., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY: Kansas City, Mo., May 9. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PEDIATRICS: St. Louis, Nov. 20. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: New York, Dec. 30. Sec., Dr. Walter Freeman, 1726 Eye St., N. W., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY: Detroit, Dec. 1-2. Sec., Dr. Byrl R. Kirklin, Mayo Clinic, Rochester, Minn.

ARIZONA: *Basic Science.* Tucson, Dec. 17. Sec., Dr. Robert L. Nugent, Science Hall, University of Arizona, Tucson.

CALIFORNIA: *Reciprocity.* Los Angeles, Dec. 4. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

CONNECTICUT: *Endorsement.* Hartford, Nov. 26. Sec., Dr. Thomas P. Murdock, 147 W. Main St., Meriden.

KANSAS: Topeka, Dec. 10-11. Sec., Board of Medical Registration and Examination, Dr. C. H. Ewing, 609 Broadway, Larned.

KENTUCKY: Louisville, Dec. 3. Sec., Department of Health, Dr. A. T. McCormack, 532 W. Main St., Louisville.

MARYLAND: *Medical (Regular).* Baltimore, Dec. 10-13. Sec., Dr. John T. O'Mara, 1211 Cathedral St., Baltimore. *Medical (Homeopathic).* Baltimore, Dec. 10-11. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

NEBRASKA: Lincoln, Nov. 19-20. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, State House, Lincoln.

NORTH CAROLINA: *Endorsement.* Raleigh, Dec. 9. Sec., Dr. Ben J. Lawrence, 503 Professional Bldg., Raleigh.

OHIO: Columbus, Dec. 3-5. Sec., State Medical Board, Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA: Oklahoma City, Dec. 11. Sec., Dr. James D. Osborn Jr., Frederick.

TEXAS: Houston, Nov. 18-20. Sec., Dr. T. J. Crowe, 918 Mercantile Building, Dallas.

VIRGINIA: Richmond, Dec. 11-13. Sec., Dr. J. W. Preston, 28½ Franklin Rd., Roanoke.

WISCONSIN: *Basic Science.* Milwaukee, Dec. 21. Sec., Prof. Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee.

California July Examination at San Francisco

Dr. Charles B. Pinkham, secretary, Board of Medical Examiners, reports the written examination held at San Francisco, July 9-11, 1935. The examination covered 9 subjects and included 90 questions. An average of 75 per cent was required to pass. One hundred and twenty-eight candidates were examined, 125 of whom passed and 3 failed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
College of Medical Evangelists		(1935)	81.8,
82.6, 82.9, 83.1, 84.8, 84.9, 89.1			
Stanford University School of Medicine		(1934)	81.3,
(1935) 77.9, 80.9, 82.2, 82.3, 82.7, 82.8, 83, 83.1, 83.7, 84, 84.8, 84.8, 85, 85.3, 85.6, 85.6, 85.6, 85.7, 85.8, 86.2, 86.4, 86.4, 86.8, 87.1, 87.3, 88.1, 88.2, 88.6, 88.9, 91.7, 92.1, 92.5			
University of California Medical School		(1935)	80.9,
84.6, 85, 85, 85.3, 85.6, 85.7, 85.7, 85.9, 86.1, 86.2, 86.4, 86.6, 87, 87.2, 87.2, 87.2, 87.7, 87.7, 87.8, 87.9, 88, 88.1, 88.2, 88.7, 88.8, 88.9, 89.4, 89.4, 89.8, 90.1, 90.2, 90.3, 90.6, 90.6, 90.8, 90.8, 91.4, 91.9, 93.3			
University of Southern California School of Medicine		(1935)	81.2,
82.3, 82.8, 85			
Yale University School of Medicine		(1933)	85.8
George Washington University School of Medicine		(1933)	79,
(1934) 80.2, 83.2			
Loyola University School of Medicine		(1935)	78.8
Northwestern University Medical School		(1931)	87.4,
(1934) 84.1, 86.3, (1935) 84.4, 86.2			
Rush Medical College		(1935)	87.4
University of Illinois College of Medicine		(1935)	86.7
Indiana University School of Medicine		(1934)	84.6
State University of Iowa College of Medicine		(1933)	82.6
Tulane University of Louisiana School of Medicine		(1934)	86.1
Johns Hopkins University School of Medicine		(1929)	88.4
University of Maryland School of Medicine and College of Physicians and Surgeons		(1934)	78.7, 87.4
Harvard University Medical School		(1933)	80.4
University of Minnesota Medical School		(1935)	83.1, 85.7
St. Louis University School of Medicine		(1934)	85.9
Washington University School of Medicine		(1935)	79.1, 85.7
Creighton University School of Medicine		(1934)	83.2,
84.6, (1935) 78.4, 86.7			
University of Oregon Medical School		(1934)	81.8, 85.4
Jefferson Medical College of Philadelphia		(1933)	82.6, (1934) 87.4
Baylor University College of Medicine		(1935)	80.6
University of Wisconsin Medical School		(1933)	81.7

School	Year Grad.	Per Cent
Queen's University Faculty of Medicine	(1922)	85.9
McGill University Faculty of Medicine	(1934)	85.1
Hamburgische Universität Medizinische Fakultät, Hamburg	(1924)	80.3*
Universität Heidelberg Medizinische Fakultät	(1933)	79.3*
Universität Leipzig Medizinische Fakultät	(1926)	83.3
University of Tomsk Faculty of Medicine, Russia	(1913)	83.7

FAILED

School	Year Grad.	Per Cent
University of California Medical Department	(1904)	56.4
Northwestern University Medical School	(1935)	73.2
Universidad Central de España Facultad de Medicina, Madrid	(1928)	63

* Verification of graduation in process.

California July Examination at Los Angeles

Dr. Charles B. Pinkham, secretary, Board of Medical Examiners, reports the written examination held at Los Angeles, July 23-25, 1935. The examination covered 9 subjects and included 90 questions. An average of 75 per cent was required to pass. One hundred and six applicants were examined, 97 of whom passed and 9 failed. The following schools were represented:

School	Year Grad.	Per Cent
College of Medical Evangelists	(1934)	77.1, 84.6, (1935) 75.3, 76.7, 77.8, 78, 78.2, 78.4, 79.1, 79.3, 81.1, 82.1, 82.2, 83.1, 83.1, 83.3, 83.6, 84.1, 84.6, 84.7, 84.8, 85.3, 85.3, 85.7, 86.2, 86.7, 86.9, 87, 89.7
Stanford University School of Medicine	(1935)	78.3, 78.7, 82.2, 82.4, 87.4
University of California Medical School	(1935)	87, 88.7
University of Southern California School of Medicine	(1935)	75.8, 78.1, 78.1, 79.4, 79.8, 80.6, 80.7, 81, 81.8, 81.8, 82.1, 83.4, 83.8, 84, 84.2, 84.3, 84.7, 84.9, 85, 85, 86.9, 89.1, 89.8
University of Colorado School of Medicine	(1911)	75.8
Loyola University School of Medicine	(1935)	77
Northwestern University Medical School	(1929) 76, (1935)	85.3
Rush Medical College	(1934)	75.9, 78.4, (1935) 76.7, 82.2, 83.9, 86, 86.1
School of Medicine of the Division of the Biological Sciences	(1935)	81.9
University of Illinois College of Medicine	(1927) (1935) 79, 80.9, 82,* 82.3, 83, 84, 85.1, 86.2, 87.1	82.4,
Indiana University School of Medicine	(1934)	80.6
State University of Iowa College of Medicine	(1931)	80.6
University of Louisville School of Medicine	(1934)	82.3
University of Maryland School of Medicine and College of Physicians and Surgeons	(1933)	79.3
Wayne University College of Medicine	(1935)	85.4
Creighton University School of Medicine	(1934)	78.2, 84.3
University of Nebraska College of Medicine	(1933)	78.3
University of Oklahoma School of Medicine	(1934)	81.8
University of Pennsylvania School of Medicine	(1934)	82.4
Woman's Medical College of Pennsylvania	(1934)	81.4
McGill University Faculty of Medicine	(1934) 82.7, (1935)	80.2
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin	(1929) 75.2,†	83.3†
Schlesische-Friedrich-Wilhelms-Universität Medizinische Fakultät, Breslau	(1925)	79.6†

FAILED

School	Year Grad.	Per Cent
College of Medical Evangelists	(1935)	74.9, 76.2‡
University of Southern California School of Medicine	(1935)	77.8‡
American Medical Missionary College, Chicago	(1902)	62.2
Northwestern University Medical School	(1935)	74.1
Rush Medical College	(1935)	71.1
Detroit College of Medicine and Surgery	(1933)	68.3
Regia Università degli Studi di Modena. Facoltà di Medicina e Chirurgia	(1932)	70.6
Regia Università degli Studi di Roma. Facoltà di Medicina e Chirurgia	(1926)	62.7†

* License withheld pending completion of application.
† Verification of graduation in process.
‡ Fell below 60 per cent in two subjects.

Iowa June Examination

Mr. H. W. Grefe, director, Division of Licensure and Registration, reports the written examination held by the Iowa State Board of Medical Examiners in Iowa City, June 4-6, 1935. The examination covered 8 subjects and included 100 questions. An average of 75 per cent was required to pass. Seventy-four candidates were examined, 73 of whom passed and 1 failed. The following schools were represented:

School	Year Grad.	Per Cent
Northwestern University Medical School	(1935)	83.5, 86.8
Rush Medical College	(1934)	87.3
University of Illinois College of Medicine	(1935)	86.8
State University of Iowa College of Medicine	(1935)	75.1,* 75.1,* 76.5,* 77.6,* 77.8,* 77.9,* 79,* 79,† 79.4,* 79.9,* 80.5,* 80.6,* 80.8,† 81.4,* 81.6,* 81.8,* 82.5,* 82.5,* 82.9,* 82.9,† 83.1,* 83.3,* 83.4,* 83.5,* 83.8,* 83.9,* 84.1,* 84.6,* 84.6,* 84.6,* 84.9,* 84.9,* 84.9,* 85.1,* 85.1,* 85.1,* 85.3,* 85.4,* 85.5,* 85.6,* 85.6,* 85.9,* 86.1,* 86.5,* 86.5,* 86.6,* 86.6,* 86.6,* 86.8,* 87.3,* 87.6,* 87.8,* 87.8,* 88.1,* 88.3,* 88.4,* 88.4,* 88.9,* 89.3,* 89.5,* 89.6,* 89.8,* 90.6,* 92.8,* 95*
University of Louisville School of Medicine	(1934)	80.1
Creighton University School of Medicine	(1934)	81.8
University of Nebraska College of Medicine	(1933)	86.1
University of Rochester School of Medicine	(1934)	87.3

FAILED

School	Year Grad.	Per Cent
State University of Iowa College of Medicine	(1934)	58.8

Nine physicians were licensed by reciprocity and 1 physician was licensed by endorsement from July 1 through August 7. The following schools were represented:

LICENSED BY RECIPROCITY

School	Year Grad.	Reciprocity with
Rush Medical College	(1932) Missouri, (1933)	Michigan
University of Illinois College of Medicine	(1934)	Illinois
Creighton University School of Medicine	(1934, 2)	Nebraska
John A. Creighton Medical College	(1920)	Nebraska
University of Nebraska College of Medicine	(1934)	Nebraska
Vanderbilt University School of Medicine	(1932)	Tennessee
Albert-Ludwigs-Universität Medizinische Fakultät, Freiburg	(1914)	Texas

LICENSED BY ENDORSEMENT

School	Year Grad.	Endorsement of
McGill University Faculty of Medicine	(1928)	N. B. M. Ex.

* License withheld pending completion of internship.
† This applicant has completed the medical course and will receive his M.D. degree in June 1936. License has not been issued.

Book Notices

Modern Home Medical Adviser: Your Health and How to Preserve It. Edited by Morris Fishbein, M.D. Fabrikoid. Price, $3.50. Pp. 905, with 140 illustrations. New York: Doubleday, Doran & Company, Inc., 1935.

The idea of a family health book is not new. For fifty years such volumes have decorated the library tables and sitting room tables in many homes along with the family Bible. However, the home medical adviser of the past was full of scientific and hardly understandable diagrams of the human interior. It contained innumerable peculiar prescriptions which represented the superstitions of the past. It was usually written by a compiler who based his discussions on similar books that had gone before.

The present volume in no way resembles these earlier tomes. It represents the assembled views of men whose names have been associated with progress in the fields they discuss. Their contributions have been rewritten and reedited in many instances to make statements easily understandable by any fairly intelligent reader.

The book opens with a chapter on the choice of a physician, indicating the types of medical colleges, the importance of state licensure, the significance of membership in medical organizations and the development of the specialties. There follow chapters on the family medicine chest and first aid, and on the hygiene of women by Dr. Fishbein. The section on sex hygiene has been prepared by Dr. Thurman B. Rice, whose name is associated with the development of a similar highly successful series in *Hygeia*. Dr. J. P. Greenhill presents a chapter on the care of the mother before and after childbirth, and this is logically followed by a chapter on the care and feeding of the child and infant hygiene by Philip P. Jeans of the University of Iowa and Frederick F. Tisdall of the University of Toronto. The general prevention of infectious disease and the considerations of the individual infectious diseases, again by Morris Fishbein, occupy more than 100 pages. Next come discussions of the diseases of the heart and circulation by N. C. Gilbert and of digestion and digestive diseases by Drs. Portis. Then the book proceeds through "The Kidney: Its Diseases and Disturbances," by Philip S. Hench; "The Blood and Its Diseases," by Raphael Isaacs; "Deficiency Diseases," by Russell M. Wilder and D. L. Wilbur, and "Allergy," by W. W. Duke. The glands are discussed by Drs. Walter Timme and Oliver P. Kimball, and Dr. E. P. Joslin has contributed a notable hundred pages on diabetes. Dr. Wingate M. Johnson discusses blood pressure, both high and low, and cancer is discussed by Dr. Francis Carter Wood. The hazards of industry are discussed by Dr. C. P. McCord. The care of the skin and hair and nails is fully outlined by Dr. Arthur W. Stillians of Northwestern University Medical School. Then come sections on the subjects of diet, posture, the care of the feet, nervous and mental disturbances, and the care of the aged. These chapters are in turn written by Solomon Strouse, Tait McKenzie, Philip Lewin, George K. Pratt and Morris Fishbein.

The book is extensively illustrated with colored plates and with 136 photographs and outline drawings. Many of these drawings are of the outline humorous type so successful in *Hygeia*. The volume is beautifully printed with a wide column and a large page. The index, which itself occupies almost sixty pages, permits the user of the volume to find readily any topic that may concern him.

In the preparation of this book, self medication, except for the slightest ailments such as are now regularly treated by every one in his own home, is completely avoided. Indeed, the dangers of self medication are emphasized throughout the book. However, the intelligent reader will gain a knowledge of how to prevent disease, of how to choose scientific medical treatment, and of how to follow intelligently his physician's instructions, thereby shortening the process of disease and particularly relieving the mind from the worry inevitably associated with unanswered questions.

Reports on Chronic Rheumatic Diseases: Being the Annual Report of the British Committee on Chronic Rheumatic Diseases Appointed by The Royal College of Physicians. Number One, edited by C. W. Buckley, M.D., F.R.C.P. Cloth. Price, 12s. 6d. Pp. 159, with 8 illustrations. London: H. K. Lewis & Co., Ltd., 1935.

The stated object of the British committee in publishing this report is to bring to the notice of those interested in chronic rheumatism recent research work from the clinic and laboratory. By way of introduction, Copeman, the secretary of the committee, reviews the origin and work of the British committee, and Fisher discusses the merits of the classification of "rheumatic diseases" adopted by the committee and the reasons therefor, with a review of the pathologic changes seen in the more common types of chronic arthritis. The remainder of the book comprises eleven articles on various phases of the subject. Some of these articles are listed as "original" and express the author's ideas on certain subjects without reference to the literature. Others are essays on particular subjects, with brief reviews of new and old literature. A few confine themselves to a review of current literature on a given subject. Appended is a list of titles and references to about 300 articles relating to chronic rheumatism, which appeared in American, British and continental European literature between April 1934 and March 1935.

The most valuable parts of the report, which are well worth the price of the volume, are the article by Freeman, on the present position of allergy and hypersensitiveness in chronic rheumatism and arthritis, and that by Race on biochemical investigations in chronic rheumatic diseases. In any consideration of two such poorly defined states as "allergy" and "rheumatism" Freeman insists we must "pick our way humbly and warily yet with courage." The author has done just that and has faced the situation frankly. Freeman's paper should be required introductory reading for any one daring glibly or critically to unite the terms "allergy" and "rheumatism." In Race's excellent paper are discussed the significance of alterations in the sedimentation rate of erythrocytes, in blood proteins, in pigments, in compounds of sulphur, in serum calcium and in serum magnesium, studies on blood groups and remarks on the chemistry of urine and synovial fluid and on estimations of the metabolic rate in rheumatic diseases. Suggestions are made for future chemical investigations, particularly on blood proteins. Miller reports preliminary observations indicating that some degree of hepatic impairment, as shown by tests of hepatic function, is present in about a third of the cases of rheumatoid arthritis, osteo-arthritis, fibrositis, sciatica and gouty arthritis. The rôle of focal sepsis is briefly considered by Willcox. Buckley reviews the nervous manifestations of vertebral rheumatism and current ideas on the cause and treatment of ankylosing spondylitis. The possible relationship of tuberculous infections to Still's disease and rheumatoid arthritis, arguments on the acceptance of "tuberculous rheumatism" as an entity, the influence of the thyroid and parathyroid glands, and the supposed rationale of their removal from rheumatic patients, the use of histamine in the treatment of myalgia and chronic rheumatism, and trends of research in this field during 1934 are additional subjects discussed (sometimes too briefly) by Moncrieff, Copeman, Fisher, Bach and Oriel.

The report is a helpful compilation of facts and ideas and is one with which students of the subject should become familiar. It will serve as a useful supplement to the formal "statement of opinion" concerning the basic ideas of rheumatic diseases given by the Arthritis Committee of the British Medical Association and published in the *British Medical Journal*, June 17, 1933, page 1041. The report of the British Committee on Chronic Rheumatic Diseases must face the criticism, however, that as a review of current literature (admittedly) it is not complete even in its presentation of recent British researches, and its comments on those studies which are discussed in some detail are not sufficiently critical. To some the publication of such a report in book form may make it more available than if it was published in a national journal of fairly wide circulation and purchasable in reprint form later (as was, for example, the recent first "Rheumatism Review" of American and English literature published for the American Committee for the Study and Control of Rheumatic Diseases in the *Annals of Internal Medicine* this spring). Others may believe the latter method preferable in making the report, in the long run, more widely available and incidentally less expensive for the reader. It is to be hoped that, however presented, future reports will be forthcoming. They should be of decided value to every one concerned in the care of the innumerable victims of these diseases.

Healthful Living. By Harold S. Diehl, M.D., Professor of Preventive Medicine and Public Health, the University of Minnesota. With an introduction by Morris Fishbein, M.D., Editor, Journal of the American Medical Association. Cloth. Price, $2.50. Pp. 354. New York & London: Whittlesey House, McGraw-Hill Book Company, Inc., 1935.

As the first volume in a new series to be called the Whittlesey House Health Series, under the editorship of Dr. Morris Fishbein, the McGraw-Hill Company presents a book by Dr. Harold S. Diehl. Dr. Diehl has been for some time associated with the care of student health at the University of Minnesota and has also been secretary of the American Student Health Association. He has thus an excellent background for the development of a book of this type and he adds to this a power of clear and concise expression which is unusual among medical writers. After a discussion of the possibilities for improving health and lengthening life, he discusses mental health and the normal sex life; then he answers the usual questions relative to tea, coffee, tobacco and alcohol, exercise, fatigue, rest, fresh air and diet. These considerations occupy ten chapters. There follow chapters on specific disease prevention, the common cold, the care of the eyes, ears, nose, throat and teeth, a consideration of the glands, the care of the aged, and finally a chapter on the choice of a physician. These excellent discussions are supplemented by a well chosen bibliography and an adequate index. The book is reasonably priced, well printed, beautifully bound, and an excellent item for recommendation by any physician to a patient who wants a book on personal hygiene.

Trattato di anestesia: Narcosi—anestesie locali, regionali, spinali. Da A. M. Dogliotti, docente di patologia chirurgica nelle R. Università di Torino. Prefazione del Prof. Ottorino Uffreduzzi. Cloth. Price, 75 lire. Pp. 552, with 253 illustrations. Turin: Unione Tipografico-Editrice Torinese, 1935.

The preface is written by Professor Uffreduzzi. In the first chapter there is a historical sketch concerning general and other anesthetics. In succeeding chapters the author covers the physiology and pathology that it is well for the anesthetist to consider in his work and also the various factors that bear on the production of anesthesia from all points of view. He describes the various signs and stages of anesthesia in a novel manner. He discusses regional anesthesia and the various types of injections, emphasizes respiratory difficulties attendant on these methods, and shows how artificial respiration should be carried out. He discusses postoperative pulmonary complications and the use of carbon dioxide and oxygen in their prevention and treatment, and various other complications. He shows most of the types of apparatus for administration of general anesthetics that are used throughout the world. He discusses ether, chloroform, ethyl chloride, vinethene and nitrous oxide and presents charts showing signs of anesthesia with chloroform, nitrous oxide and ethylene. He takes up cyclopropane, acetylene, tribrom-ethanol and intravenous anesthesia, especially with *n*-methyl-cyclohexenylmethylmalonylurea sodium. He also

discusses preliminary medication and basal anesthesia. He elaborates his own method of peridural anesthesia and discusses in great detail spinal anesthesia and the different methods of its production. For all those who read Italian, this is a valuable book.

Asylum. By William Seabrook. Cloth. Price, $2. Pp. 263. New York: Harcourt, Brace & Company, 1935.

The name of this author is widely known because of his contributions to anthropology, ethnology and travel. Some time ago, feeling himself under the influence of alcoholic addiction, he voluntarily entered an institution for the mentally defective and submitted himself to retention, during which time he overcame completely the craving for alcoholic liquors and obtained an insight into modern methods of caring for the mentally sick. His book reads like a novel but is accurate and should be of great value in carrying to people generally a better idea of modern methods and a better understanding of those who suffer with mental diseases. Although published but a short time ago, the book has already passed through several editions and is listed among nonfiction best sellers. Every physician will find it a welcome addition to his correlated reading in medical work. There are occasional passages of a "blue" character, which may interfere with a general recommendation of the book to younger readers.

The Ordinary Difficulties of Everyday People. By John Rathbone Oliver. Cloth. Price, $2.75. Pp. 296. New York & London: Alfred A. Knopf, 1935.

Dr. Oliver is a combination of priest, physician, novelist and scholar. His writings have attracted more than ordinary attention in their special field. The present book is a series of philosophical comments on babies and children, poets and dramatists, school and the home. The author discusses youth, social ambitions, medical schools and a great many of the other aspects of modern life. There are chapters on compensations, on marriage, on the dangerous age and on old age. To all his comments the author brings a ripe wisdom and a wide experience of human life seen in the various capacities in which he has lived and worked. It is a book that repays careful reading and is sure to benefit many a troubled mind.

Around a World on Fire: Exploits and Escapes of an Austrian World War Surgeon. By Karl E. Kassowitz. Cloth. Price, $2. Pp. 198, with illustrations by Hans V. Schrötter. Milwaukee: The Author (Gutenberg Publ. Co.), 1935.

The experiences of physicians during the World War were probably as extraordinary and varied as those of any other group. The author of this volume, who is now a physician in Milwaukee, served as a front line surgeon with the Austrian army. After being captured, he did some work in Russia, going eventually to a prison camp in Siberia. With another physician he escaped in Chinese disguise and traveled across China, finally reaching Peiping. From there he came to the United States and from there he traveled back to Austria. He has a flare for what is dramatic and he tells his story with literary simplicity. Some extraordinary drawings have been contributed by Hans V. Schrötter.

The Stomach and Duodenum. By George B. Eusterman, M.D., F.A.C.P., Head of Section in Division of Medicine, The Mayo Clinic, and Donald C. Balfour, M.B., M.D., LL.D., Head of Section in Division of Surgery, The Mayo Clinic, and Members of the Staff, The Mayo Clinic and the Mayo Foundation for Medical Education and Research. Cloth. Price, $10. Pp. 958, with 436 illustrations. Philadelphia & London: W. B. Saunders Company, 1935.

This splendid book covers all phases of diseases of the stomach and duodenum in a complete manner. Not only have Eusterman and Balfour stated the medical and surgical sides especially well but their colleagues at the Mayo Clinic have contributed a number of complete and up-to-date chapters on the physiology, pathology and roentgenology of this most important part of the gastro-intestinal tract. The newest methods and tests both for diagnosis and for treatment are clearly stated. A good bibliography is given with each chapter. The book contains much authoritative information and it is well balanced and concise. There are a large number of illustrations, which are unusually well done.

This book should serve not only as a textbook for the student and the general practitioner but also as a reference book for the internist and the surgeon.

Celsus: De Medicina. Volume I. With an English translation by W. G. Spencer, M.S., F.R.C.S. In two volumes. Cloth. Price, $2.50. Pp. 499. Cambridge, Massachusetts: Harvard University Press, London: William Heinemann, Ltd., 1935.

It is well to have in one of the fine translations made available by the Loeb Classical Library this excellent translation of the contribution of Celsus. A brief introductory note outlines the most valuable features of the work and discusses the much debated question as to whether or not Celsus was a physician or merely a translator of an old Greek work on medicine. The conclusion of Dr. W. H. S. Jones, who writes the introduction, is to the effect that Celsus must certainly have had considerable medical experience. For all purposes that would have made him a doctor in early Rome.

Réactions labyrinthiques et équilibre l'ataxie labyrinthique. Par G. G. J. Rademaker, professeur à l'ünïversité de Leyden. Préface du Professeur Georges Guillain. Paper. Price, 80 francs. Pp. 262, with 124 illustrations. Paris: Masson & Cie, 1935.

After a preface by Georges Guillain and some introductory remarks by the author, in which some of the historical aspects of labyrinthine reactions are discussed, Rademaker devotes his first chapter to the reactions produced by movements in a rectilinear plane. This is followed by a chapter on the various methods and types of labyrinthine stimulation in animals and man. The illustrations, which are numerous and illuminating, include photographs of movie films showing the body movements of experiments with animals, during falling and turning. The work is supplemented by a complete bibliography. The text is most readable, the subject is presented in a well organized and clear manner, and the work as a whole is a valuable addition to the literature on labyrinthine reactions. From both a scientific and a practical standpoint it should prove of great value to all otologists and to all others who are interested in the important investigation of the vestibular mechanism and knowledge concerning it.

Berättelse från styrelsen för cancerföreningen i Stockholm över verksamhetsåret 1934. Index of Papers Published at the Radiumhemmet 1909-1934. Report on Cases Treated at the Radiumhemmet 1921-1934. Paper. Pp. 94. Stockholm: K. L. Beckmans Boktryckeri, 1935.

This report is divided into three parts. The first part, which is in Swedish, covers the activities of the cancer society in Stockholm in 1934. The second part lists the papers published by Radiumhemmet in the years 1909 to 1934. The third part gives a tabular summary of the cases treated at Radiumhemmet from 1921 to 1934. The report will interest all who are concerned actively with the control and treatment of cancer.

The Story of Medicine in the Middle Ages. By David Riesman, M.D., Sc.D., Professor of the History of Medicine, University of Pennsylvania. Cloth. Price, $5. Pp. 402, with 80 illustrations. New York: Paul B. Hoeber, Inc., 1935.

This volume traces the rise of medicine and surgery from the time of the school of Salerno through the period of Paracelsus. Special chapters concern the development of the great universities, the work of the Arabian and the Jewish physicians, the rise of surgery, the great plagues and manias, the origins of syphilis, the textbooks of the period, and the hospitals. The volume concludes with a discussion of the public's attitude toward medicine of that period. The book is handsomely printed and well illustrated. It presents a selection from the vast amount of material now available of those facts and factors which should be of greatest interest to the physician of today and also provides the philosophical comments of the author, which are never without interest.

Clinical Atlas of Blood Diseases. By A. Piney, M.D., M.R.C.P., Assistant Physician, St. Mary's Hospital for Women and Children, London, and Stanley Wyard, M.D., M.R.C.P., Physician, The Cancer Hospital, London. Third edition. Cloth. Price, $4. Pp. 110, with 38 illustrations. Philadelphia: P. Blakiston's Son & Co., Inc., 1935.

The classification of blood as well as of various types is becoming constantly more and more complex and difficult. Few physicians can keep abreast of the new discoveries in relationship to the types of blood as well as the variations that occur in blood diseases. This atlas provides a series of excellent illustrations, which will serve for use on the laboratory table beside the microscope.

Medicolegal

Birth Control: Sale of Contraceptives Regulated.—A Wisconsin statute limits to pharmacists and physicians the right to sell drugs, medicines, mixtures, preparations, instruments, and articles and devices, used or intended to be used to procure miscarriages or to prevent pregnancy. Such articles may be sold or disposed of only to married persons. To prevent the evasion of this statute, it forbids the manufacture, purchase, rental, possession or control of any slot machine or other means designed and constructed so as to contain such articles and to release them on the deposit of a coin or other thing of value. Wis. Stats., 1933, section 351.235.

The defendant, the proprietor of an oil station, permitted a vending machine to be placed in the men's wash-room on his premises, adapted for the vending of the forbidden articles or of some of them, although susceptible of use for vending lawful merchandise. The machine bore signs reading "Sold only for the prevention of disease" and "Minors are prohibited to operate this machine." Representatives of the police department deposited 10 cents in the machine and it delivered an article commonly used for contraceptive purposes. The defendant was convicted in the district court and in due process the case came before the Supreme Court of Wisconsin. The defendant contended that the act was so vague and indefinite as to be unconstitutional. Many articles with innocent and lawful uses were covered by it—for instance, many drugs, medicines, instruments and devices—simply because they were susceptible of use to prevent conception or to produce abortion. The act, the defendant contended, could not be read by those affected by it with any fair chance of arriving at its precise meaning.

The act is not drafted with the precision that is desirable, said the Supreme Court, but the court must give effect to its intent, when that is clear, rather than to its letter. Its intent is to be gathered from the whole statute and not from words and phrases separated from their contexts. The act covers only drugs, medicines, mixtures, preparations, instruments, articles and devices that are "used or intended or represented to be used" to procure a miscarriage or for preventing pregnancy. It is not lightly to be assumed that the legislature intended the act to cover articles having legitimate common uses, simply because they are susceptible of use for improper purposes. The limiting words in the statute, "used or intended or represented to be used," are to be construed, in the opinion of the court, to mean (1) articles solely capable of use as contraceptives or abortifacients and (2) articles appropriate for use as contraceptives and abortifacients and sold with the intent or purpose that they be so used or with the representation that they are effective for that purpose.

Applying to the case the principle enunciated in *Youngs Rubber Corporation* v. *C. I. Lee & Co.* 45 F. (2d) 103,[1] the court concluded that it was the intent of the legislature to deal in the statute under which prosecution was brought with articles whose sole purpose, or whose intended purpose or represented function, is to produce abortion or to prevent pregnancy and that in general it was the intention of the legislature wholly to prohibit the sale of such articles to unmarried persons or by any one except a physician or pharmacist.

Defendant's contention that the notices on the vending machine on his premises, "Sold only for the prevention of disease" and "Minors are prohibited to operate this machine," were conclusive as to the purpose for which sales were made was rejected by the court. The sale of the device that was sold in this case, said the court, in a public toilet, by a mechanical vending machine, was a sufficient warrant for the inference that the purpose of its sale was contraception and not merely the prevention of disease.

The judgment of conviction by the court below was affirmed. —*State v. Arnold (Wis.), 258 N. W. 843.*

Workmen's Compensation Acts: Apoplexy and Insanity Following Minor Injury of Hand.—A workman, 55 years old, injured his hand slightly, in the course of his employment. He had a stroke of apoplexy within a few days thereafter and another stroke a few months later. Subsequently he became insane. A claim for compensation was filed with the workmen's compensation bureau, which the bureau rejected. The court of common pleas, however, reversed the bureau's order. Thereupon the employer appealed to the supreme court of New Jersey.

The claim for compensation was based on the theory that an embolus originated in the injury of the hand, was thrown off into the blood stream, passed through a persistent congenital opening between the arterial and venous sides of the heart [patent foramen ovale], and lodged in the brain instead of in the lungs, where it normally would have lodged but for the abnormal opening. Medical testimony conceded that this was a possibility, but it showed that the workman had arteriosclerosis, with involvement of the heart and kidneys, and that clinical examination failed to disclose a patent foramen ovale. When a man is 55 years of age, said the supreme court, and shows all the symptoms of arteriosclerosis, with involvement of the heart and kidneys, it is more reasonable to accept the hypothesis that the apoplexy was the natural result of the progress of arteriosclerosis than that it was due to an embolus, thrown off from a slight wound of the hand, passing to the brain because of an alleged congenital defect, which occasionally occurs in children, who do not long survive, and is rare in adults. Compensation, continued the court, is not allowable for injuries caused by the natural progress of a disease from which a workman is suffering. Accordingly, the judgment of the lower court was reversed and compensation denied.—*Hahne & Co. v. Guenther (N. J.), 178 A. 58.*

Accident Insurance: Death from Dislodgment of Kidney Stone an Accidental Death.—The defendant insurance company promised to pay to the beneficiary of an insurance policy double indemnity if the insured died from external, violent and purely accidental means, and not directly or indirectly as the result of disease or physical infirmity. After a fall as he was getting out of his automobile, the insured had a bruised spot over one kidney, and thereafter he suffered "the excruciating pain which usually accompanies the presence of a kidney stone in the ureter." A kidney stone, according to the report, obstructed the ureter, causing "hydronephritis," which was followed by "pyonephritis" and then by hypostatic pneumonia, which caused death. The insurer refused to pay double indemnity and the beneficiary brought suit. The trial court took the view that physical infirmity contributed to the death and directed a verdict for the insurer. The beneficiary appealed to the Supreme Court of Minnesota.

The stone that caused death measured 1.5 by 6 by 6 cm. (one-half by 2½ by 2½ inches) and had "certain prongs or projections" which, in the opinion of the plaintiff's doctors, were likely to prevent its dislodgment from the part of the kidney in which it was being formed, unless there was an abnormal abdominal pressure, such as the blow which the insured received when he fell. They regarded the stone as harmless to the health of the insured except as it might be dislodged and pass into the ureter. Before the accident the insured apparently was in the best of health, and all medical witnesses agreed that if there had been no kidney stone the fall would not have killed him.

1. In this case, the United States Court of Appeals, Second Circuit, in construing phraseology similar to that now under consideration, in federal statutes relating to the transportation of contraceptives and abortifacients in the United States mail or in interstate commerce in any manner whatever, said: "Taken literally, this language would seem to forbid the transportation by mail or common carriage of anything 'adapted,' in the sense of being suitable or fitted, for preventing conception or for any indecent or immoral purpose, even though the article might also be capable of legitimate uses and the sender in good faith supposed that it would be used only legitimately. *Such a construction would prevent mailing to or by a physician of any drug or mechanical device 'adapted' for contraceptive or abortifacient uses, although the physician desired to use or to prescribe it for proper medical purposes. The intention to prevent a proper medical use of drugs or other articles merely because they are capable of illegal uses is not lightly to be ascribed to Congress. Section 334 forbids also the mailing of obscene books and writings; yet it has never been thought to bar from the mails medical writings sent to or by physicians for proper purposes, though of a character which would render them highly indecent if sent broadcast to all classes of persons.* See United States v. Chesman, 19 F. 497, 498 (C. C. E. D. Mo.); United States v. Clarke, 38 F. 500, 502 (D. C. E. D. Mo.); United States v. Smith, 45 F. 476, 478 (D. C. E. D. Wis.); United States v. Dennett, 39 F. (2d) 564, 568 (C. C. A. 2). It would seem reasonable to give the word 'adapted' a more limited meaning than that above suggested and to construe the whole phrase 'designed, adapted or intended' as requiring an intent on the part of the sender that the article mailed or shipped by common carrier be used for illegal contraception or abortion or for indecent or immoral purposes. See Bours v. United States, 229 F. 960, 964 (C. C. A. 7). However, we do not find it necessary to decide this question in the present case." Youngs Rubber Corporation v. C. I. Lee & Co., 45 F. (2d) 103.

The issue of the case on appeal turned on the answers to two questions: Is death, caused by the lodgment in the ureter of a kidney stone which a fall has dislodged from the kidney, "accidental" within the meaning of the policy? If so, is such death caused by external, violent and purely accidental means, and not caused directly or indirectly by disease or physical infirmity? Although the trial court took the view that physical infirmity contributed directly or indirectly to death, the Supreme Court was more cautious. It cited *Silverstein* v. *Metropolitan Life Insurance Company*, 254 N. Y. 81, 171 N. E. 914, in support of the postulate that "when the abnormality was so remote in its potential mischief that common speech would call it not disease or infirmity but at most a predisposing tendency, the fact that it started and was made operative by violence so that death resulted did not prevent the violence from being considered the sole cause of the death." The Supreme Court professed to have no difficulty distinguishing between the present case and cases in which the insured was suffering from chronic disease, such as diabetes or nephritis, which impairs the health and weakens the resistance so that when aggravated by violence the disease causes death. The difference, said the court, lies in that in one case the disease is merely aggravated by the violence, while in the other it is in its fatal aspects entirely set in motion by the violence. Applying this rule to the case before it, the court concluded that the jury might justly find that violence was the sole cause of death. For that reason, the Supreme Court reversed the judgment of the court below and remanded the case for a new trial.—*Mair v. Equitable Life Assur. Soc. of United States (Minn.), 259 N. W. 60.*

Malpractice: Operation Without Consent Implies Injury; Scope of Lawful Malpractice Defense by Medical Society.—The defendant, a physician, removed several moles from the face of a minor child. The patient's mother, acting as guardian, alleged that her child had been disfigured by the treatment and sued the defendant. She alleged, among other things, that the treatment given by the defendant was given without her consent or consent of her daughter, the patient. Judgment was given against her and she appealed to the Supreme Court of Errors of Connecticut.

The instructions given to the jury by the trial court were such as might have led the jury to believe that the plaintiff was not entitled to damages unless she proved not only that the defendant treated his patient without consent but also that his patient was in fact injured by his treatment. This, said the Supreme Court of Errors, was incorrect. The removal of the moles, if done without consent, was a trespass and had the legal effect of an assault, and an assault, even without specific proof of injury from it, entitles the plaintiff to at least nominal damages. "Every human being of adult years and sound mind has a right to determine what shall be done with his own body; and a surgeon who performs an operation without his patient's consent commits an assault, for which he is liable in damages." *Schloendorff* v. *New York Hospital*, 211 N. Y. 125, 105 N. E. 92. But the erroneous instruction given by the trial court could have had no adverse effect further than to cause the plaintiff to lose a verdict for nominal damages and costs, and errors of such limited effect do not ordinarily warrant the reversal of a judgment.

Dr. Standish was called as a witness for the plaintiff. After counsel for the plaintiff had examined him and after the witness had been cross-examined, the plaintiff sought on redirect examination to show that he was not disinterested. Counsel for the plaintiff proposed to introduce evidence to show that this witness, Dr. Standish, and the defendant were fellow members of the Hartford Hospital Society; that both of them practiced as specialists in the same field; that the plaintiff's witness had without compensation treated the patient on whom the defendant had operated, for several months, trying to remove the scars attributed to the defendant's treatment, and that such services were rendered gratuitously, pursuant to an agreement among the members of the hospital society to render free treatment to a patient of a fellow member if that member was sued under circumstances such as were present in this case; that the hospital society had a committee charged with the duty of determining whether, in any given case, there had been malpractice; and that, in consideration of lowered premiums paid by each member, a blanket policy of insurance was issued to the members of the society. The trial court, however, refused the proffer of the plaintiff's counsel of evidence to prove these things. Counsel for the plaintiff asked a physician whom he had summoned as a witness whether he had not been told by telephone, by a physician on the staff of the New Britain Hospital, that he would be "run out of town" if he testified against the defendant, but the court excluded this testimony.

Counsel, said the Supreme Court of Errors, after he has called a witness and sought the benefit of his testimony, may contradict him by another witness, but he cannot directly impeach him unless it is shown to the satisfaction of the court that the testimony of his witness has taken counsel by surprise or is inconsistent with other statements made by the witness. Counsel must, before he undertakes to impeach his own witness out of his own mouth, show that the witness is adverse or hostile, or show some equally potent reason, as the interests of justice under the circumstances of the case seem to the court to require. The Supreme Court of Errors, however, was unable to find anything in the record in this case suggestive of hostility on the part of the plaintiff's witness, Dr. Standish, or of any unwillingness on his part to answer questions put to him, or anything else to justify an exception to the general rule regarding the impeachment of witnesses.

Counsel for the plaintiff was seeking by the questions asked of his witness, Dr. Standish, and by the testimony that he proffered, to show that the medical society of which Dr. Standish was a member had endeavored to use its influence to prevent the plaintiff from securing expert medical testimony in support of her claim. There can be no question, said the court, of the right of the society to investigate any claim of malpractice brought against any one of its members or to render such member any proper aid in his defense. The limits of such proper aid, however, manifestly do not include the production of testimony which is untrue or of opinions of witnesses which are not honestly entertained by them, or the prevention of the attendance of witnesses, or the suppression of any relevant evidence, or any other interference with the orderly and normal course of court procedure. Any act of such improper character by any member of the society, or participation in it by him, would render such member liable to statutory penalties and, it might be, for conspiracy at common law.

The Supreme Court of Errors found no reversible error in the rulings of the trial court.—*Schmeltz v. Tracy (Conn.), 177 A. 520.*

Society Proceedings

COMING MEETINGS

American Academy of Tropical Medicine, St. Louis, Nov. 20-21. Dr. Earl B. McKinley, 1335 H Street N.W., Washington, D. C., Secretary.

American Association for the Study of Neoplastic Diseases, Baltimore, Dec. 19-21. Dr. Eugene R. Whitmore, 2139 Wyoming Avenue N.W., Washington, D. C., Secretary.

American Society of Tropical Medicine, St. Louis, November 19-22. Dr. Alfred C. Reed, 350 Post Street, San Francisco, Secretary.

American Student Health Association, New York, Dec. 27-28. Dr. Harold S. Diehl, University of Minnesota Medical School, Minneapolis, Secretary.

Eastern Section, American Laryngological, Rhinological and Otological Society, Newark, N. J., Jan. 3. Dr. Henry B. Orton, 24 Commerce St., Newark, N. J., Chairman.

Medical and Surgical Association of the Southwest, El Paso, Texas, Nov. 21-23. Dr. W. Warner Watkins, 15 East Monroe Street, Phoenix, Ariz., Secretary.

Middle Section, American Laryngological, Rhinological and Otological Society, Milwaukee, Jan. 11. Dr. William E. Grove, 324 East Wisconsin Avenue, Milwaukee, Chairman.

National Society for the Prevention of Blindness, New York, Dec. 5-7. Dr. Lewis H. Carris, 50 West 50th Street, New York, Managing Director.

Puerto Rico, Medical Association of, Santurce, Dec. 13-15. Dr. Euripides Silva, Ave. Fernandez Juncos, Parada 19, Santurce, Secretary.

Radiological Society of North America, Detroit, Dec. 2-6. Dr. Donald S. Childs, 607 Medical Arts Building, Syracuse, N. Y., Secretary.

Society of American Bacteriologists, New York, Dec. 26-28. Dr. I. L. Baldwin, College of Agriculture, University of Wisconsin, Madison, Wis., Secretary.

Southern Medical Association, St. Louis, November 19-22. Mr. C. P. Loranz, Empire Building, Birmingham, Ala., Secretary.

Southern Surgical Association, Hot Springs, Va., Dec. 10-12. Dr. E. W. Alton Ochsner, 1430 Tulane Ave., New Orleans, Secretary.

Western Surgical Association, Rochester, Minn., Dec. 6-8. Dr. Albert H. Montgomery, 122 South Michigan Boulevard, Chicago, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Periodicals are available from 1925 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Cancer, New York

25: 1-250 (Sept.) 1935

Malignant Tumors of Peripheral Nerves. A. P. Stout, New York.—p. 1.

Studies of Fowl Tumors Induced by Carcinogenic Agents: I. Seasonal Factor Influencing Rate of Growth and Transmissibility. P. R. Peacock, Glasgow, Scotland.—p. 37.

Id.: II. Attempted Transmission by Cell Free Material. P. R. Peacock, Glasgow, Scotland.—p. 49.

*Studies on Chemical Treatment of Tumors: II. Effect of Disturbances in Fluid Exchange on Transplanted Mouse Tumors. M. J. Shear, Boston.—p. 66.

Chorionepithelioma in the Male. H. C. Fortner and S. E. Owen, Hines, Ill.—p. 89.

*Two Island Cell Adenomas of Human Pancreas Cultivated in Vitro. Margaret R. Murray and Cloyce F. Bradley, New York.—p. 98.

Hyperplastic Epidermal Disease in Winter Flounder Infected with Cryptocotyle Lingua (Creplin). G. M. Smith, New Haven, Conn.—p. 108.

Breeding Behavior and Tumor Incidence of an Inbred Albino Strain of Mice. J. J. Bittner, Bar Harbor, Maine.—p. 113.

Glycolysis of Varicus Substrates by Extracts of Sarcoma and of Muscle. F. H. Scharles, M. D. Baker and W. T. Salter, Boston.—p. 122.

Tumors of Digestive Tract. C. F. Geschickter, Baltimore.—p. 130.

Treatment of Tumors and Effect of Disturbances in Fluid Exchange.—In experiments on fluid exchange, Shear employed a variety of substances and procedures in empirical attempts to alter the water content of tumor cells or to damage them by excessive intake of fluid or by excessive loss of fluid from the tumor. No hemorrhagic reaction was noted with histamine, but two tumors (sarcoma 180) receded and the slight retardation that occurred in the growth of the treated tumors may have been due to the treatment. The results with peptone were negative. In the mice treated with agar, one tumor receded completely and several tumors retrogressed. In the experiments with pneumococcus antibody and pneumococcus soluble specific carbohydrate, hemorrhages were observed in several of the tumors but no clear cut effect on tumor growth was obvious. In tumor-bearing mice, complete withdrawal of drinking water resulted in earlier death than in non-tumor-bearing control mice. Massive bleeding did not have a pronounced effect on tumor growth, although it seemed in some experiments to result in smaller tumors; this may well have been due to the general poor condition of the mice and not to a specific effect on the tumors. The various diuretics employed did not seem to influence the growth of the tumors. With acacia, recession of the tumor occurred in a few instances; in a few other instances, liquefaction occurred apparently as a result of the treatment. With egg albumin and with serum albumin, a retarding influence was noted in a few instances. In one experiment with horse serum, hemorrhage or striking destruction of the interior of the tumor was obtained in twelve out of seventeen mice; in some cases the tumor grew again, but in three mice there was complete recession. With sublethal doses of meningococcus filtrate, hemorrhages were obtained in the tumors. Many of the mice died, but, in the survivors, some tumors receded and grew again while others receded completely. Sodium oleate also produced hemorrhage or liquefaction in an apparently significant number of cases.

Island Cell Adenomas of Pancreas Cultivated in Vitro.—Murray and Bradley cultivated in vitro two adenomas of the islands of Langerhans from two human adults for periods of five weeks and six and one-half weeks, respectively. The vitality of the explants was undiminished at the end of these periods. The two series of cultures from the two tumors differed from each other in much the same degree as the tumors differed in morphology. The behavior of the cultures from these presumably benign tumors was less irregular than the behavior of cultures of normal young and embryonic animal pancreas as reported by other workers. March 19, 1935, six cultures of one of the tumors were inserted into the axilla of a diabetic member of the staff who had volunteered to receive them. She had been maintained in normal health and activity over a period of twelve years by the injection of 20 units of insulin twice a day. Previous to the grafting the cultures had been grown for three weeks in the recipient's plasma, and the grafting procedure followed in general the technic of Stone, Owings and Gey for parathyroid transplantation through tissue culture. At the time of the last passage of each explant the medium from which the culture was cut was plated on blood agar for additional assurance that it was bacteriologically sterile. Since the transplantation the patient has been kept on a regimen of 18 units twice a day, and weekly tests of her blood sugar and urine sugar have been made. On June 12 no significant change in the level of blood or urine sugar had been registered.

American Journal of Clinical Pathology, Baltimore

5: 349-454 (Sept.) 1935

Vaccine Treatment of Acute Anterior Poliomyelitis of Monkeys. J. A. Kolmer and Anna M. Rule, Philadelphia.—p. 349.

Qualitative Changes in Neutrophilic Leukocytes. R. L. Haden, Cleveland.—p. 354.

*Diffuse Decidual Hyperplasia of Endometrium in Absence of Pregnancy. H. L. Reinhart, Columbus, Ohio.—p. 365.

*Interpretation of Histologic Findings in Encephalitis Congenita. A. L. Amolsch, Detroit.—p. 371.

Studies of Pathologic Body Fluids: Cholesterol Partition and Total Protein Content. M. Bruger, New York.—p. 384.

*Pathologic Changes Resulting from Accurately Controlled Artificial Fever. F. W. Hartman and R. C. Major, Detroit.—p. 392.

Value of One-Hour Two-Dose Glucose Tolerance Test (Exton and Rose) in Early Diagnosis of Diabetes Mellitus. H. T. Kelly, J. T. Beardwood Jr. and K. Fowler, Philadelphia.—p. 411.

The Rose Bengal Liver Function Test as Adapted to Sheard-Sanford Photelometer. A. S. Giorando and D. Eager, South Bend, Ind.—p. 417.

Method for Quantitative Examination of Conjunctival Fluid in Preparation for Intra-Ocular Operations. F. M. Johns, New Orleans.—p. 428.

Determination of Protein in Cerebrospinal Fluid. R. S. Hubbard and Helen R. Garbutt, Buffalo.—p. 433.

Sensitivity of Wassermann Antigens in Relation to Rate of Dilution. A. J. Casselman, Camden, N. J.—p. 443.

Decidual Hyperplasia of Endometrium in Absence of Pregnancy.—Reinhart gives the histologic pattern and history that suggested the diagnosis of "decidua menstrualis" in a nonpregnant patient. Comparison of this case with three others in which diffuse decidual hyperplasia was present, one with chorionic villi and two without demonstrable villi giving clinical histories suggestive of early abortion, indicate a common etiology. The principal symptom of the present case was the periodically recurring, profuse, prolonged, white discharge with very little blood. Histologic examination presented little evidence of the mechanism by which the discharge was produced. However, the uterus was removed at a time during which there was clinically little discharge present. Whether this discharge was the result of the involution of the corpus luteum or of local inadequate nutrition associated with the rapid tissue growth has not been determined. If the involution of the corpus luteum is the mechanism by which this discharge is brought about, the diagnosis of "decidua menstrualis" might be competent. Histologic examination of hyperplastic decidual tissue removed in the three cases cited, during the discharge, presents a similarity to the early phase of menstruation.

Microscopic Observations in Congenital Encephalitis.—Amolsch investigated the etiologic and pathologic features of the brains of forty-six cases of incomplete cerebral development that exhibited in some degree the cellular features of encephalitis. The brains, ranging in fetal developmental age from 12 weeks to term, were subjected to uniform cross-sectioning throughout the entire ventricular system. None of these infants survived longer than forty-eight hours after birth. Every brain in the series exhibited some degree of subependymal cellular activity. The degree of activity was proportional to the degree of hypodevelopment. The nature of the reaction was in no manner different in location, extent or cellular character from that seen in cases interpreted as congenital encephalitis. Subependymal infiltration of small round cells and perivascular mantles of such cells, found in the brain of the new-born, are not to be interpreted as an expression of inflam-

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mation. It is definitely developmental in nature. This reaction is most pronounced in the prematurely born infants. Between the twelfth and the twenty-eighth week of fetal development this reaction forms a prominent mass over the basal ganglion beneath the lateral ventricle. The most prominent exhibit of the incomplete state of cerebral development in the term or near term infant is observed in the angle between the caudate nucleus and the thalamus and at the upper lateral angle of the lateral ventricle in sections through the anterior half of the brain. Incomplete cerebral development at birth offers a distinct liability to cerebral and ventricular hemorrhage during birth and to late hypodevelopment, gliosis and possible gliomatous tumor formation in later life. Congenital encephalitis by itself can exist, but such a diagnosis must depend on the presence of a true inflammatory reaction; cellular changes associated with development must be excluded from the criteria supporting such a diagnosis.

Pathologic Changes Resulting from Accurately Controlled Artificial Fever.—The study of Hartman and Major on the pathologic changes resulting from artificial fever therapy consist of two clinical cases coming to necropsy after fever therapy and of twenty dogs, eighteen of which were subjected to fever of various durations and degrees and two of which were used as controls, being given excessive amounts of sodium amytal, a sedative used in all but two of the other experiments and in the human cases. They found that the pathologic changes in the human cases and the experimental animals were engorgement of the blood vessels, especially the capillaries, hemorrhage and degeneration. The most vital changes seen were those in the brain, amounting to hemorrhagic encephalitis in some instances, those in the lung constituting hemorrhagic pneumonia and those in the adrenal characterized by degeneration in the cortex with hemorrhage. Death occurring during or immediately after treatment was due to vascular collapse. Although the changes described have been noted in animals receiving morphine alone as a sedative, the human patients and most of the animals received sodium amytal, a drug which in large amounts is known to produce congestion and even capillary damage, especially in the brain. Since fever therapy and sodium amytal tend to produce marked dilatation and engorgement of blood vessels, the authors suggest that the combination should not be used in patients.

American J. Digestive Diseases and Nutrition, Chicago

2: 391-448 (Sept.) 1935

Philosophic, Clinical and Retrospective Discussion of Certain Major Problems in the Digestive Field. T. R. Brown, Baltimore.—p. 391.
Migraine: Common Sense Approach. Libby Pulsifer, Rochester, N. Y. —p. 397.
Validity of Fractional Gastric Analysis. Frances A. Hellebrandt and Elizabeth Brogdon, Madison, Wis.—p. 402.
Studies on Relation of Nonspecific Ulcerative Colitis to Bacillary Dysentery, with Particular Reference to Dysentery Bacteriophage. A. Winkelstein and C. Herschberger, New York.—p. 408.
The Pancreas and General Metabolism: Physiologic, Metabolic and Philosophic Concept of Nutritional Unity and Interdependence. W. N. Boldyreff, Battle Creek, Mich.—p. 413.
What Should Be the per Capita per Day Milk Consumption of Our Population? L. Arnold, Chicago.—p. 416.
Treatment of Food Allergy and Indigestion of Pancreatic Origin with Pancreatic Enzymes. A. W. Oelgoetz, P. A. Oelgoetz and Juanita Wittekind, Columbus, Ohio.—p. 422.
*Histidine in Treatment of Peptic Ulcer: Preliminary Report. J. T. Eads, Philadelphia.—p. 426.
Bleeding Gastric and Duodenal Ulcers. D. P. MacGuire, New York. —p. 431.

Histidine in Treatment of Peptic Ulcer.—Eads treated thirty-five cases of peptic ulcer with intramuscular injections of a 4 per cent solution of histidine hydrochloride, averaging twenty-four injections with no local or systemic reaction. Six patients, three with gastric ulcers and three with duodenal ulcers in which the average history of symptoms was two and one-half years, showed immediate clinical and roentgen evidence of cure. Symptomatic relief of distressing complaints was usually evident after the first three or four injections. The gain in weight was the most marked. None of these patients were restricted as to diet or placed on medication. None of them, after a period of observation of six months or more, have shown any recurrence. Five showed some decline in the acid curve, but not to normal figures. Eight patients presented definite clinical and roentgen improvement, not so rapidly as the first group, but still definite. There were six duodenal ulcers and two gastric ulcers in this group. Six patients showed a gain in weight. Five began to show improvement after the tenth injection, two after the fifteenth and the remaining one after the twenty-third injection. Five were on no dietary restrictions, three were advised regarding elimination of tobacco, coffee, alcohol and so on, and one had alkalis at times, but not regularly. The average duration of symptoms in the group was four and one-half years. Nine patients showed some clinical improvement but no roentgen change. The symptomatic improvement was much slower than it was in the other two groups, and not until eighteen or more injections had been given was any improvement noted. These were all duodenal ulcers with an average history of six years. There were some dietary restrictions imposed in three cases with little or no medication given. Twelve patients were unimproved after the completion of twenty-four injections. Three of these were given further injections—two were given thirty injections and one thirty-six with no improvement noted. At times experiments were made with a fairly rigid dietary schedule and alkalis were given in seven cases with no appreciable change in the symptoms. Seven of this group were classified as obstructive lesions of a varying degree and were not improved at all. In three of these the symptoms appeared aggravated by the injections and four showed a loss of weight. Operations were subsequently performed in three of the obstructive cases with one fatality due to pulmonary infarct. Of these twelve patients showing no immediate improvement, three subsequently appeared to show definite improvement a week or so after the completion of injections, after being placed on a strict orthodox medical regimen, when before the injections such a treatment had been of no value. This suggests the possibility of some delayed benefit. The duration of symptoms in this group was the longest. These were for the most part ulcers that are resistant to treatment and were complicated by some obstructive phenomena in seven cases.

American Journal of Pathology, Boston

11: 711-894 (Sept.) 1935

Lesions of Left Auricle in Rheumatic Fever. L. Gross, New York. —p. 711.
Virus of Lymphogranuloma Inguinale. R. D'Aunoy, E. von Haam and L. Lichtenstein, New Orleans.—p. 737.
Rhabdomyosarcoma of the Prostate. F. H. Foucar, Washington, D. C. —p. 753.
Anencephalic Monster with "Rhinodymie" and Other Anomalies. S. B. Broder, Chicago.—p. 761.
*Anomalies of Circle of Willis with Resulting Encephalomalacia and Cerebral Hemorrhage. O. Saphir, Chicago.—p. 775.
Experimental Gastric Erosions Following Hypothalamic Lesions in Monkeys. E. C. Hoff and D. Sheehan, New Haven, Conn.—p. 789.
Functional Cor Triloculare Biatria: Report of Case with Malposition of Septum in Ventricles. D. Kornblum, Brooklyn.—p. 803.
Improved Technic for Silver Impregnation of Reticulum Fibers. Helenor Campbell Wilder, Washington, D. C.—p. 817.

Anomalies of Circle of Willis.—Saphir states that anomalies of the circle of Willis, with resulting interruption of the circulation between the internal carotid and vertebral arteries, may form the anatomic basis of cerebral vascular disturbances. The recognition of such anomalies aids in the explanation of cerebral hemorrhage and encephalomalacia on morphologically demonstrable grounds in the absence of occluding lesions of the supplying arteries. In addition to local causes for encephalomalacia and cerebral hemorrhage the condition of the myocardium and evidence of myocardial failure in the various organs should be considered. Three brains are described which revealed anomalies of the circle of Willis involving the posterior communicating arteries, and an abnormal origin of the posterior cerebral artery in one case. Two of these brains revealed areas of encephalomalacia and cerebral hemorrhage, without the presence of occluding lesions in the supplying arteries. Whereas the posterior communicating arteries are not essential in the maintenance of the circulation of the brain under normal conditions, a free unhampered collateral anastomosis between the internal carotid and vertebral arteries is important in instances of diffuse arteriosclerosis of the arteries of the base of the brain combined with beginning myocardial failure. This conception of the origin of these brain lesions is based on morphologically demonstrable changes and does not require the assumption of theoretical functional disturbances of the circulation.

American Journal of Physiology, Baltimore

113: 1-250 (Sept. 1) 1935

Relation of Parathyroid Hormone to State of Calcium in Blood. F. C. McLean, B. O. Barnes and A. B. Hastings, Chicago.—p. 141.
Total Plasma Protein in Normal and Fasting Rats. W. C. Cutting and R. D. Cutter, San Francisco.—p. 150.
Effect of Different per Cents of Protein in Diet on Bachelor and Virgin Rats. J. R. Slonaker, Stanford University, Calif.—p. 159.
Effect of Reduced Atmospheric Pressure on Leukocyte Count. O. O. Meyer, M. H. Seevers and S. R. Beatty, Madison, Wis.—p. 166.
Effect of Cholecystokinin on Choledochoduodenal Mechanism (Sphincter of Oddi). P. Sandblom, W. L. Voegtlin and A. C. Ivy, Chicago. —p. 175.
*Effect of Changes in Environmental Temperature on Blood Pressure and Pulse Rate in Normal Men. J. S. Gottlieb, Worcester, Mass.—p. 181.
Acid-Base Changes in Serum of Dog Associated with Hyperthermia of Dinitrophenol Administration. E. Muntwyler, V. C. Meyers, W. H. Danielson and Carla Zorn, Cleveland.—p. 186.
Relative Significance of Electrolyte Concentration and Tissue Reaction in Water Metabolism. H. A. Davis and L. R. Dragstedt, Chicago. —p. 193.
Influence of Partial Adrenalectomy on Work Capacity of Rats. D. J. Ingle, W. M. Hales and G. M. Haslerud, Minneapolis.—p. 200.
Specific Gravity of Blood of Normal Rabbits and Cats and Splenectomized Rabbits Before, During and After Emotional Excitement. L. B. Nice and H. L. Katz, Columbus, Ohio.—p. 205.
Correlated Studies of Calcium, Inorganic Phosphorus and Serum Phosphatase in Normal Animals and in Animals Influenced by Irradiated Ergosterol. S. Freeman and C. J. Farmer, Chicago.—p. 209.
Basal Metabolism and Iodine Excretion During Pregnancy. Lena Enright, Versa V. Cole and F. A. Hitchcock, Columbus, Ohio.—p. 221.
Further Study of Cardiac Reflexes. R. S. Morison, Boston.—p. 229.
Plasma Protein Determinations in Lactating Women. S. C. Peacock and Winifred Franz Hinman, Chicago.—p. 235.
Influence of Ovarian Hormones, Estrin and Progestin, on Menstrual Cycle of Monkey. G. W. Corner, Rochester, N. Y.—p. 238.

Effect of Environmental Temperature on Blood Pressure.—In a study of the effect of an increase in the environmental temperature on the systolic and diastolic blood pressures and pulse rates of sixteen normal men, Gottlieb found that: 1. When the room temperature was maintained between 23.1 and 23.9 C. (73.6 and 75 F.) for an observation period of three and one-half hours, the mean pulse rate decreased significantly —9.9 beats per minute, the mean systolic blood pressure showed no change and the mean diastolic blood pressure increased significantly—8.7 mm. of mercury. 2. When the room temperature was increased from 23.6 to 33.2 C. (74.5 to 91.7 F.) during the period of three and one-half hours, the mean pulse rate increased 2.6 beats per minute during the first hour, then decreased significantly—5.8 beats per minute, the mean systolic blood pressure showed no change and the mean diastolic blood pressure increased significantly—3 mm. of mercury. 3. A study of the differences of the two experimental days indicated that as a result of an increase of 9.6 degrees C. (17.2 degrees F.) in the air temperature the mean pulse rate increased significantly, the mean systolic blood pressure showed no change and the mean diastolic blood pressure decreased significantly.

Archives of Ophthalmology, Chicago

14: 325-526 (Sept.) 1935

Diagnostic Value of Defects in Visual Fields and Other Ocular Disturbances Associated with Supratentorial Tumors of the Brain. J. H. Globus and S. M. Silverstone, New York.—p. 325.
Lattice Type of Corneal Dystrophy. T. M. Shapira, Chicago.—p. 387.
Late Traumatic Roset Cataract. L. Lugli, Bologna, Italy.—p. 392.
Larocaine, a New Anesthetic. L. L. Mayer, Chicago.—p. 408.
Genesis of Refraction of Human Eye. S. Ochapovsky, Krasnodar, U. S. S. R.; edited by B. Friedman, New York.—p. 412.
*Analysis of Fifty-Five Cases of Tobacco-Alcohol Amblyopia. F. D. Carroll, New York.—p. 421.
Filaria Subconjunctivalis: Report of Case. J. S. Cregar, East Orange, N. J., and E. B. Burchell, New York.—p. 435.
*Cervical Sympathectomy in Retinitis Pigmentosa: Preliminary Report on Results. G. de Takáts and S. R. Gifford, Chicago.—p. 441.
Checking Station for Tonometers. A. Posner, New York.—p. 453.
Retinoscopy at a Definite Distance. J. D. Weintraub, Cincinnati.—p. 458.
Is Full Correction of Value in Checking Progress of Myopia? D. M. Rolett, New York.—p. 464.
Provisions for Schooling of Blind and Partially Blind. E. M. Van Cleve, New York.—p. 473.

Tobacco-Alcohol Amblyopia.—Carroll studied fifty-five cases of toxic amblyopia associated with the use of tobacco and alcohol. He feels that the diagnosis could be made earlier and more often if studies with the tangent screen were performed more frequently. The condition should not be confused with early senile macular degeneration. The amblyopia may develop after the use of only moderate quantities of tobacco and alcohol, and these substances should be considered as only two factors that, when combined with others, bring about the disease. Extensive medical, neurologic, dental and otologic examinations were carried out on the patients, and the results are presented. The progress of the disease was followed by numerous ophthalmic reexaminations over a period of many months, and the relation of abstinence to improvement was especially noted. The value of abstinence is stressed, but cases are cited in which the patients improved without markedly decreasing their use of tobacco and alcohol. There is great variability in the normal course of the disease, and this should be considered in attempting to evaluate the effect of any treatment.

Cervical Sympathectomy in Retinitis Pigmentosa.—De Takáts and Gifford performed sympathetic denervation of the eye to improve the visual acuity and visual fields of six patients suffering from retinitis pigmentosa. Of eleven operations, four consisted of cervicodorsal and seven of superior cervical ganglionectomies. The latter, particularly if combined with a stripping of the internal carotid artery, seems to be the simplest and most constantly reliable method of obtaining complete sympathetic denervation. The test of complete sympathetic denervation was the failure of cocaine to dilate the contracted pupil. Not one of these patients showed an increase in visual acuity or in the visual fields. One younger patient reported an improvement in night blindness. None of them showed progress of the disease, but the longest period of observation was only a year and a half. The only possible benefit of sympathectomy on dark adaptation and minimal light perception in these patients seems to be that which might arise from halting the progress of the disease. A later report will be necessary to recommend or condemn the procedure definitely.

Archives of Surgery, Chicago

31: 507-676 (Oct.) 1935

*Fascial Sarcoma and Intermuscular Myxoliposarcoma. J. Ewing, New York.—p. 507.
Anal Ducts: Comparative and Developmental Histology. C. C. Tucker and C. A. Hellwig, Wichita, Kan.—p. 521.
Fibrosarcoma of Right Forearm with Extensive Growth into Cephalic Vein. G. G. Davis, Chicago.—p. 531.
*Clinical and Histologic Changes Produced in Carcinoma of Cervix by Different Amounts of Roentgen Radiation: Comparison. A. N. Arneson and F. W. Stewart, New York.—p. 542.
Longitudinal Growth of Long Bones. J. D. Bisgard and M. E. Bisgard, Omaha.—p. 568.
Clean Intestinal Anastomosis: II. Experimental Study. E. J. Poth, San Francisco.—p. 579.
Pendulous Hypertrophic Breast: Comparative Values of Present-Day Methods of Repair and Procedure of Choice. J. W. Maliniak, New York.—p. 587.
Multiple Meningiomas: Report of Case in Which Three Intracranial Meningiomas Were Removed Successfully. J. E. Raaf and W. M. Craig, Rochester, Minn.—p. 601.
*Acute Abdominal Pain in Sickle Cell Anemia. E. H. Campbell Jr., Albany, N. Y.—p. 607.
Changes Produced by Various Operations on Stomach Shown by Use of Modified Acid Test Meal. F. C. Hill, L. C. Henrich and C. M. Wilhelmj, Omaha.—p. 622.
Fatal Cases of Septicemia Caused by Bacillus Coli Following Gastric Operations. F. W. Ilfeld, Cleveland.—p. 632.
*Experimental Staphylococcic Suppurative Arthritis and Its Treatment with Bacteriophage. G. A. L. Inge and J. W. Toumey Jr., New York.—p. 642.
Effect of Diet on Weight of Liver and Glycogen Concentration in Partially Hepatectomized Rats. C. S. Stone Jr., Santa Barbara, Calif.—p. 662.

Fascial Sarcoma.—Ewing points out that the term fascial sarcoma should be restricted to the fibromas, fibrosarcomas, fibrochondromas or parosteal osteosarcomas originally described and designated as fascial sarcoma by Virchow. It should not be employed for intermuscular myxosarcomas. The intermuscular myxosarcoma, often called fascial sarcoma, is probably derived from fat lobules and presents the structure of embryonal mucous tissue or embryonal fat tissue. It is rarely, if ever, of traumatic origin and is often radiosensitive. The common liposarcoma of the trunk and limbs is derived from adult fat tissue and presents the structure of large granular cells, such as those seen in chronic inflammation of fat tissue. The structure varies greatly with the degree of malignancy. It seems to be occasionally of traumatic origin. The degree of radiosensitivity of the primary tumor is uncertain, but the recurrent

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tumors are radioresistant. It appears that two types of liposarcoma may be recognized, one the myxoliposarcoma of embryonal structure and the other the granular cell liposarcoma of the adult type. Liposarcoma of both types is comparatively common in the region of the hip, knee, shoulder and trunk. It runs a characteristic clinical course, usually recurring after operation and proving fatal from infection, sepsis and metastases to the lungs. Since some are radiosensitive, it is recommended that all bulky tumors of the soft parts be submitted to treatment with high voltage radiation before surgical intervention is resorted to.

Changes Produced in Carcinoma of Cervix by Roentgen Irradiation.—Arneson and Stewart call attention to the necessity of delivering a larger dose of external radiation to the parametrium if any advance is to be made in the cure of cervical carcinoma. The treatment recommended consists in increasing the target skin distance for external irradiation from 50 to 70 cm., using multiple portals (from four to six) and delivering at least 2,000 roentgens to each field within a period of about three weeks. This method delivers approximately from 3 to 3.2 threshold erythema doses to the cervix and somewhat less to the parametrium if four portals are used, and slightly more if six portals are employed. The percentage of satisfactory clinical regressions parallels the increase in the doses. The microscopic regressions tend to parallel the clinical regressions. Polypoid lesions show the greatest clinical regression with external irradiation. Crateriform lesions appear the least susceptible. The latter usually constitute a more advanced clinical type of disease. Local cure from external irradiation is exceptional with the doses used. Complete temporary epithelization of the primary lesion is not uncommon. Despite successive biopsies showing progressive degeneration of the tumor and occasionally complete disappearance of disease in one or more specimens examined at the end of the period of external irradiation, the tumor tends almost inevitably to reappear in a histologic form that is apt to resemble closely the initial tumor. Hence restraint of growth is but a transient phenomenon. For this reason the authors have little hope that the methods described will control more than a minor percentage of tumors with parametrial extensions. It is thought, however, that the dose to the parametrium may be increased.

Acute Abdominal Pain in Sickle Cell Anemia.—Campbell enumerates the abdominal symptoms and signs most commonly found in sickle cell anemia and reports six cases in which the abdominal manifestations were conspicuous. Many patients with the active form of the disease at times have attacks of acute abdominal pain, fever, mild jaundice and leukocytosis. The pain may be in the left upper quadrant, suggesting splenic infarcts, or in the epigastrium and right upper quadrant, simulating cholecystitis or hepatic tenderness from other causes or even gastric or duodenal disease. Again, there may be a cramplike pain, either generalized or localized in the epigastrium, associated with nausea, vomiting, obstipation and distention and strongly suggesting intestinal obstruction. Instances are known in which acute appendicitis has been mimicked, and on occasions acute salpingitis has been erroneously diagnosed. The symptoms and signs may vary in the same person from day to day, so that more than one abdominal condition is portrayed. The establishment of the presence of sickle cell anemia and the decision that the abdominal symptoms are or are not attributable to this disease are the two obvious steps in the diagnosis. Leukocytosis is usually present in the abdominal crises of sickle cell anemia and is often much higher than that which would be expected of the simulated disease. Jaundice due simply to uncomplicated sickle cell anemia is not obstructive; hyperbilirubinemia, hyperurobilinuria and usually an indirect van den Bergh reaction and urobilin in the highly colored stools are present. The most widely accepted theory is that pain is due to infarcts in the spleen or to the perisplenitis so frequently observed at necropsy. These could account for many of the symptoms, particularly the pain in the left upper quadrant and epigastrium and perhaps the tympanites. They do not so readily explain the pain and tenderness in the right upper quadrant and over McBurney's point or that in the lower part of the abdomen. Enlargement of the liver may in some way be responsible for the hypochondriac pain on the right side, but this is not likely. There is no specific therapy for the disease or for the abdominal crises. General supportive measures, hygienic improvements and transfusions, if the hemoglobin concentration is very low, are customarily employed for the disease itself. For the abdominal manifestations a policy of watchful waiting with mild sedatives, heat and enemas is all that seems advisable. Patients with this disease not seldom become candidates for some form of operative therapy unconnected with the anemia. Patients with the latent form stand such procedures as well as other people, but patients in whom the disease is or has been in active phase may occasionally do very badly.

Experimental Staphylococcic Arthritis and Bacteriophage.—Inge and Toumey tested the efficacy of bacteriophage therapy in infections of the joints under controlled conditions in six series of dogs (from four to sixteen): 1. Suppurative arthritis of the knee was produced and left untreated to determine the course of the disease. 2. The effect of repeated injections of bacteriophage alone and of broth alone were studied. 3. Purulent arthritis was produced in both knees with subsequent repeated injections of bacteriophage into the left knee, the right remaining as a control. 4. Bacteria suspended in broth were injected into the right knee, and into the left knee the same dose of bacteria suspended in bacteriophage was injected; no subsequent bacteriophage treatments were given. 5. Dogs were treated as in series 4, but with a more potent bacteriophage. 6. A bacteria-bacteriophage mixture incubated for varying lengths of time before the injections were made was injected into the left knee, while bacteria alone were injected into the right knee as a control. The experiments establish the following facts: 1. Acute suppurative arthritis can be produced in the dog's knee with the staphylococcus, the lesion showing a tendency to subside spontaneously and the duration of the infection varying in different dogs. 2. Repeated injections of bacteriophage alone into the knee joint of a normal dog are not without some danger of the formation of mild acute synovitis. 3. Repeated injections of broth alone into the normal knee cause no such arthritis. 4. Bacteriophage is useless as the sole means of protecting a joint against a closed suppurative arthritis. 5. The failure of bacteriophage to act in such a situation is due to complicated biologic reactions not elucidated by this series of experiments but probably in great part related to the inactivation of bacteriophage by body fluids. 6. The presence of serum "antiphage" does not exert any deleterious influence on the outcome of such experiments.

Journal of Nutrition, Philadelphia

10: 233-350 (Sept. 10) 1935

New Toxicant Occurring Naturally in Certain Samples of Plant Foodstuffs: XI. Effect of Feeding Toxic and Control Foodstuffs Alternately. K. W. Franke, Brookings, S. D.—p. 233.

*Iron Requirement of Normal Human Adult. G. E. Farrar Jr. and S. M. Goldhamer, Ann Arbor, Mich.—p. 241.

Metabolism in Rat of Naturally Occurring Arsenic of Shrimp as Compared with Arsenic Trioxide. E. J. Coulson, Washington, D. C.; R. E. Remington and K. M. Lynch, Charleston, S. C.—p. 255.

Nutritive Value of Animal Tissues in Growth, Reproduction and Lactation: III. Nutritive Value of Beef Heart, Kidney, Round and Liver After Heating and After Alcohol Extraction. W. H. Seegers and H. A. Mattill, Iowa City.—p. 271.

Some Effects of Cod Liver Oil and Wheat Germ on Retention of Iron, Nitrogen, Phosphorus, Calcium and Magnesium During Human Pregnancy. Callie Mae Coons and R. R. Coons, Stillwater, Okla.—p. 289.

Food Value of Ethyl Alcohol. H. H. Mitchell, Urbana, Ill.—p. 311.

Study of Iron Metabolism with Preschool Children. Leah Ascham, Experiment, Ga.—p. 337.

Rat's Milk and Stomach Contents of Suckling Rats. D. T. Mayer, Columbia, Mo.—p. 343.

Iron Requirement of Normal Adult.—Farrar and Goldhamer observed a healthy man, aged 26, who carried on his usual duties as a graduate student for 316 days on a diet with an average daily iron content of 4.9 mg. During the last thirty-one days of this period the subject was in iron balance when the diet contained 5.2 mg. of iron daily. The blood hemoglobin, blood iron and red blood cell levels were within normal limits. Two other male subjects were likewise in iron balance after four and five months on diets containing 7.1 and 7.8 mg. of iron daily, respectively, and their blood contained normal amounts of hemoglobin and red blood cells. A young woman living for more than a month on a diet containing 9.1 mg. of iron daily was in iron balance during the intermenstrual phase. The total menstrual blood loss represented 33 cc. of the sub-

ject's blood. Normal urinary iron amounts to about 0.02 mg. per hundred cubic centimeters of urine. These observations, together with those in the previous literature, indicate that the iron requirement of the normal adult male is not more than 5 mg. daily.

Medical Bull. of Veterans' Adm., Washington, D. C.

12: 111-220 (Oct.) 1935

Experiences with Collapse Therapy. J. J. Beatty.—p. 111.
Spinal Anesthesia: Ten Year Study. M. Shimberg.—p. 117.
Regional Anesthesia. G. E. Pfeiffer.—p. 129.
Psychoses of Presenium. J. H. Baird.—p. 135.
Narcolepsy. H. W. Baxley.—p. 143.
Detelectasis. W. H. Watterson.—p. 149.
Myocardial Failure. R. J. Coney.—p. 154.
*Food Poisoning in Hospitals and Domiciliary Institutions. P. B. Matz. —p. 159.
Diathermy in Treatment of Pneumonia. F. W. Schwarz.—p. 167.
Blood Sedimentation Test in Pulmonary Tuberculosis. F. Shoemaker. —p. 168.
Postgraduate Training of Physicians of Veterans' Administration. L. G. Beardsley.—p. 170.
Identification of X-Ray Films in Court Trials. H. A. Bardwell.—p. 173.
Pulmonary Abscess. H. H. Gallatin.—p. 178.

Food Poisoning in Hospitals.—Matz stresses the fact that insistence on personal cleanliness of the employees of the dietetic department of hospitals and domiciliary institutions is an insurance against outbreaks of food poisoning. It is essential that food handlers be instructed to scrub their hands with soap and water prior to the preparation of meals or the handling of food. As a means of preventing outbreaks, all food handlers should be examined periodically to ascertain whether or not they are carriers of the bacteria that are commonly found in cases of food poisoning. Employees found to be such carriers should be promptly transferred from the dietetic department. The elimination of rodents, vermin and flies from the kitchens and dining rooms will prevent food poisoning, as they are carriers of bacteria, commonly the cause of such outbreaks. Insufficient refrigeration of cooked or uncooked foods is a frequent cause of food decomposition and outbreaks of food poisoning. Cooked or uncooked foods, as well as pastries, should not be left uncovered and at room temperature, thus inviting bacterial contamination and bacterial growth. The principal Salmonella group of organisms found in cases of outbreaks of food poisoning are Salmonella aertrycke (Bacillus paratyphosus B) of animal origin, Salmonella enteritidis of Gärtner and Salmonella choleraе-suis. In addition the staphylococcus, streptococcus and Clostridium botulinum are frequent bacterial contaminants of foods. All these organisms are capable of generating toxins that may contribute to the symptoms which usually accompany outbreaks of food poisoning. A review of the four outbreaks recorded by the author indicates that the principal factor responsible for the poisoning was insufficient refrigeration of various foods. There is a possibility that one outbreak was caused by staphylococci, which were found under the fingernails of food handlers.

Michigan State M. Society Journal, Grand Rapids

34: 521-574 (Sept.) 1935

Carcinoma of Uterus: Its Early Diagnosis and Treatment. W. D. Fullerton, Cleveland.—p. 521.
Tuberculosis in Adolescent. D. S. Brachman, Detroit.—p. 529.
Acute Cataracts: Presumably Due to Dinitrophenol Therapy. B. F. Glowacki, Detroit.—p. 535.
*Bitterling Pregnancy Test. R. G. Owen and H. E. Cope, Detroit. —p. 536.
Recurrent Vomiting. T. D. Gordon, Grand Rapids.—p. 537.
Outbreak of Typhoid Fever Due to Carrier. C. H. Benning, Royal Oak. —p. 541.
Proper Treatment of Concomitant Convergent Strabismus. L. J. Croll, Detroit.—p. 543.
Aeroplane View of Medical Practice in Europe. L. J. Gariepy, Detroit. —p. 546.

Bitterling Pregnancy Test.—Owen and Cope were unable to confirm the results of the bitterling pregnancy test reported by Kanter, Bauer and Klawans. Strongly positive results were obtained with seven out of twenty fish tested with specimens from nonpregnant women. These false positives occurred chiefly in premenstrual and postmenstrual specimens. Interval specimens were usually negative. False positive results were obtained with five out of sixteen fish tested with male urines.

New England Journal of Medicine, Boston

213: 505-550 (Sept. 12) 1935

Physics of High Frequency Currents as Used in Medicine—Diathermy, Radiothermy and the Electric Knife. E. L. Chaffee, Belmont, Mass. —p. 505.
Therapeutic Use of Short Wave Currents. W. Bierman and M. Schwarzschild, New York.—p. 509.
Diagnostic Possibilities in Soft Tissue Radiography. J. R. Carty, New York.—p. 517.
Routine Vision Testing of School Children: Plea for Standardization. J. J. Regan, Boston.—p. 519.
*Arsenic in Human Tissues and Food Animals: I. So-Called Normal Arsenic. W. F. Boos and A. B. Werby, Boston.—p. 520.
Trichinosis in Boston. W. W. Spink and D. L. Augustine, Boston. —p. 527.
Trichiniasis Among Jews. H. Morrison, Boston.—p. 531.
Energy Requirement in Strenuous Muscular Exercise. H. T. Edwards, A. Thorndike Jr. and D. B. Dill, Boston.—p. 532.

213: 551-592 (Sept. 19) 1935

Treatment of Compound Fracture of Skull: Study of One Hundred and Eighty-Five Cases. D. Munro, Boston.—p. 551.
Lead Encephalitis Due to Tri-Ethyl Lead: Report of Case. K. M. Bowman and P. M. Howard, Boston.—p. 559.
Adjustments During Four Years of Patients Handicapped by Poliomyelitis. Ellen H. Barbour, Lexington, Mass.—p. 563.
Method of Repair of Femoral Hernias by Fascial Strip from Aponeurosis of External Oblique Muscle. G. A. Marks, Boston.—p. 565.
Congenital Pyloric Obstruction. C. F. McGill, Portsmouth, N. H. —p. 567.
Progress in Laryngology. L. A. Schall, Boston.—p. 574.

Arsenic in Human Tissues and in Tobacco.—Boos and Werby find that all hair contains arsenic; that is to say, arsenic determinable by ordinary forensic analysis. This arsenic is being constantly excreted by the hair, which constitutes an important organ of elimination for this poison, but the expulsion of arsenic by hair is a comparatively slow process at any time. The arsenic is taken up by the roots of the hair, where it is fixed, and, as the hair grows, any of the metal that has been absorbed grows out with it. They believe that the only logical answer to the increased amount of arsenic in the hair is that the food which we eat today contains more arsenic than was formerly present in food. Remington has noted that the arsenic of the body is usually attributable to food, because of (1) chemical treatment in manufacture, (2) absorption by plants from the soil, (3) presence in sea food and (4) the widespread use of arsenical sprays in America. Headden found that our virgin soils contain from two and one-half to five parts per million of arsenic and the underlying marl from four to fifteen parts, and that the crops grown on such soils, and the animals fed on these crops contain arsenic. The arsenic content of American cod liver oils offers some startling information. Holmes and Remington in their examination of twenty samples, comprising six geographic types, found very high amounts of arsenic. The average arsenic content of the oils is calculated to the trioxide and was found from 1.8 to 4.4 parts per million. The examination of human bone in poisoning cases showed that, when the individual lived only a few hours, the amount in the bone was quite small, whereas the bone of patients who had lived several days showed a substantial quantity of arsenic. A study of the bones of food animals, purchased at a market, showed quite high figures, particularly the bones of beef cattle. Two popular pipe tobaccos and two well known cigaret tobaccos were examined and it was found that tobacco (pipe) A contained 13.3, tobacco (pipe) B 9.5, tobacco (cigaret) C 11 and tobacco (cigaret) D 9 parts of arsenic per million.

Philippine Journal of Science, Manila

57: 1-148 (May) 1935. Partial Index

Notes on Philippine Mosquitoes, II: Uranotaenia Group. F. E. Baisas, Manila.—p. 63.

Psychoanalytic Quarterly, Albany, N. Y.

4: 371-536 (July) 1935

Quantitative Dream Studies: Methodological Attempt at Quantitative Evaluation of Psychoanalytic Material. F. Alexander and G. W. Wilson, Chicago.—p. 371.
Psychoanalytic Study of Significance of Self Mutilations. K. A. Menninger, Topeka, Kan.—p. 408.
Primal Scene, Play and Destiny. G. H. Graber, Stuttgart, Germany. p. 467.
Psychogenesis of Organic Symptoms: Note. L. J. Saul, Chicago.— p. 476.
Lactation in a Virgin. W. Briehl and E. W. Kulka, New York.—p. 484.

Public Health Reports, Washington, D. C.

50: 1211-1238 (Sept. 6) 1935

Further Studies on Production of Dibenzanthracene Tumors in Pure Strain and Stock Mice. H. B. Andervont.—p. 1211.

Acute Response of Guinea-Pigs to Vapors of Some New Commercial Organic Compounds: VIII. Butanone. F. A. Patty, H. H. Schrenk and W. P. Yant.—p. 1217.

Review of Gastroenterology, New York

2: 187-278 (Sept.) 1935

The Gallbladder Problem. M. E. Rehfuss, Philadelphia.—p. 187.

*Study of Effects of Long Continued Basic and Acid Diet. J. C. Doane, Philadelphia.—p. 194.

Tuberculous Ulcer of Stomach: Report of Case with Necropsy Findings. D. M. Grayzel, New Haven, Conn.—p. 204.

Gastro-Intestinal Factors in Angina Pectoris. J. B. Wolffe, Philadelphia, and Anna Samuelson, New York.—p. 208.

Choline and Gastro-Intestinal Tract. B. Jablons and E. Bader, New York.—p. 217.

Two Diabetic Cases: Study in Social Background. Dorothy E. Flitcroft, New York.—p. 222.

Public Health Nursing in the Health Triangle. Alma C. Haupt, New York.—p. 231.

Effects of Long Continued Basic and Acid Diet.—Over a period of approximately six weeks Doane studied the effect of basic diets on the acid-base regulatory mechanism, gastric acidity and chemical change of patients with arthritis, hyperacidity and gastric ulcer. With diets predominatingly basic to a high degree, urine p_H rose with maximal effects in some cases after the third week. The plasma carbon dioxide combining power and the blood p_H resisted any change except to a minor degree. Gastric acidity was reduced in one patient, but little or not at all in the other patients. Clinical improvement was particularly noted in one patient with arthritis characterized by lessened joint pain and beneficial effect on constipation and other intestinal symptoms. The effect of diets high in excess acid ash were studied on patients with achlorhydria and achylia, including a group of five patients with pernicious anemia. In one patient with arthritis and achlorhydria there was a definite return of free hydrochloric acid. No definite change was noted in other cases of achlorhydria or achylia with pernicious anemia. Though consistently acid urines were obtained on this diet, no constant change in blood p_H was noted. An occasional lowering of the plasma carbon dioxide combining power was noted with no change in the blood p_H, an indication of moderate compensated acidosis. The use of foods high in excess acid ash and iron is recommended for cases of hypochromic anemia with achlorhydria. A control group of patients receiving alternating basic and acid meals was observed. Though basic ash tended to exceed acid ash in these patients, little change in urine, blood or gastric reaction could be observed. These observations substantiated the thought that consistently high basic or acid diets for prolonged periods are necessary before demonstrable changes are to be expected. The separation of the ingestion of basic and acid foods from meal to meal has no scientific basis to support it as a therapeutic measure dependent on restoration and maintenance of the acid base equilibrium of the body.

Rhode Island Medical Journal, Providence

18: 129-146 (Sept.) 1935

Study of Nasal Infections. J. N. Fishbein and E. J. Staff, Providence.—p. 129.

South Carolina Medical Assn. Journal, Greenville

31: 145-166 (Aug.) 1935

The Pediatrician Looks at the Tonsil. R. M. Pollitzer, Greenville.—p. 145.

Differential Diagnosis of Bright's Disease. J. A. Bradley, Florence.—p. 151.

Southwestern Medicine, Phoenix, Ariz.

19: 301-330 (Sept.) 1935

Calcium Metabolism and Its Rôle in Healing of Diseased and Injured Tissues. J. W. Flinn, Prescott, Ariz.—p. 301.

The Juvenile Osteochondrodystrophies. E. W. Johns, Albuquerque, N. M.—p. 306.

Interpretation of Blood Cholesterol Determinations. R. Davison, Tucson, Ariz.—p. 311.

*Unusual Allergenic Property of Autolyzed and Decomposed Proteins. O. H. Brown, Phoenix, Ariz.—p. 314.

Unusual Allergenic Property of Autolyzed and Decomposed Proteins.—Brown states that autolyzed, fermented or decomposed proteins are more prone to act as allergens than are fresh, unchanged proteins or normally digested proteins. Fresh foods may undergo spoiling in the alimentary canal before they have had a chance to undergo normal peristalsis. It would seem that in certain cases a mild intestinal stimulant taken with food may prevent allergic reactions by stimulating peristalsis, mixing food and alimentary canal secretions, allowing normal digestion and inhibiting bacterial putrefaction. Green fruits and vegetables as ordinarily obtained have had hours of exposure to temperatures that promote chemical change. Canned fruits and vegetables are probably generally taken with more or less dispatch from the picking to the cannery, where little time is supposedly lost in getting them into the can. This may be an argument for canned overfresh fruits and vegetables—unless they really are fresh. The long time that cereals are kept before they are consumed may have something to do toward promoting sensitizations to them.

Tennessee State Medical Assn. Journal, Nashville

28: 361-402 (Sept.) 1935

The Failing Heart. C. B. Laughlin, Greeneville.—p. 361.

Brucella Infection (Undulant Fever, Abortus Fever, Malta Fever), with a Survey of Cases Occurring in Memphis and Shelby County—1934. W. R. Blue, Memphis.—p. 365.

Ocular Tuberculosis—Tuberculin. R. J. Warner, Nashville.—p. 376.

Version: Its Indications and Advantages. G. W. Stone, Knoxville.—p. 382.

Renal Dwarfism. P. C. Elliott, Nashville.—p. 386.

Urologic Problems in Children of Interest to the General Practitioner. G. R. Livermore, Memphis.—p. 391.

Texas State Journal of Medicine, Fort Worth

31: 307-364 (Sept.) 1935

Cancer As We Comprehend It. A. C. Broders, Rochester, Minn.—p. 312.

Early Diagnosis of Cancer of Cervix and Body of Uterus. T. A. Pressly, San Antonio.—p. 316.

Surgery in Carcinoma of Uterus, Cervix and Body. A. L. McMurrey, Houston.—p. 318.

X-Rays and Radium in Treatment of Carcinoma of Cervix and Fundus. R. H. Millwee, Dallas.—p. 321.

Cancer of Uterus from the Pathologist's Point of View. J. L. Goforth, Dallas.—p. 324.

Modern Refinements in Cataract Extraction. R. K. Daily, Houston.—p. 330.

Persimmon Phytobezoar in the United States. F. Y. Durrance, Houston.—p. 336.

Uterine Hemorrhage: Its Pathology and Clinical Significance. B. F. Stout and D. A. Todd, San Antonio.—p. 340.

*Use of Sclerosing Solution in Cure of Chronic Sinuses. M. W. Sherwood, Temple.—p. 347.

Sclerosing Solution in Treatment of Sinuses.—Sherwood states that in 1933 Cutler and Zollinger called his attention to the use of sclerosing solution in the treatment of cysts and fistulas. During his work in the empyema service in the government hospitals during the World War he used 20 per cent bismuth and cottonseed oil in empyema cavities and branchial fistulas to outline the cavities and the fistulas. He found that in practically every instance of chronic empyema the bacterial count was rapidly lowered by these injections, even more so than with the use of standardized surgical solution of chlorinated soda. He also found that a number of branchial fistulas healed rapidly in some instances and slowly in others from the bismuth and cottonseed oil injections. Since then he has tried this in other sinuses and fistulas about the body with surprisingly good results. Two of the cases that he reports, in which the repeated injections of bismuth had failed, led to the trial of the modified Carnoy's solution, as suggested by Cutler and Zollinger. Since then he has cured several patients and is trying this treatment in other cases; sufficient time has not elapsed to justify presenting the end results.

West Virginia Medical Journal, Charleston

31: 437-484 (Oct.) 1935

Our Changing Times. M. Fishbein, Chicago.—p. 437.

Evolution of Otolaryngology as a Medical Specialty. J. E. Brown Sr., Columbus, Ohio.—p. 448.

Anesthetic Hazards in Patients with Heart Disease. D. C. Ashton, Beckley.—p. 458.

Diagnosis and Treatment of Carcinoma of Rectum. A. E. Weinstein, Steubenville, Ohio.—p. 461.

Presacral Neurectomy for Certain Vesical Conditions. O. H. Fulcher, Welch.—p. 465.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Children's Diseases, London

32: 163-240 (July-Sept.) 1935

Contribution to Epidemiology of Acute Poliomyelitis. H. Wennerberg. —p. 163.
Neurologic Complications of Varicella: Clinical and Epidemiologic Study. E. A. Underwood.—p. 177.
Analysis of Over Four Thousand Cases of Educational Deafness Studied During the Past Twenty-Five Years. M. Yearsley.—p. 196.

British Journal of Physical Medicine, London

10: 57-72 (Aug.) 1935

Rheumatoid Arthritis: Its Etiology and Treatment by Diathermy. C. A. Robinson.—p. 58.
Restoration of Skin Function by Octozone Therapy. Sheila Macpherson. —p. 63.

British Medical Journal, London

2: 439-484 (Sept. 7) 1935

Injuries to Semilunar Cartilages. C. A. Pannett.—p. 439.
Addiction to Endocrine Gland Extracts. S. W. Patterson.—p. 442.
*Essential Purpura Haemorrhagica. B. Myers.—p. 445.
High Blood Pressure: Note. J. Hartsilver.—p. 449.
Scarlet Fever: Attempted Immunization in Public School. L. R. Lempriere.—p. 450.
Chronic Amebiasis and Chronic Appendicitis. W. Wilkinson.—p. 452.

Essential Hemorrhagic Purpura.—Myers points out that in essential hemorrhagic purpura the spleen is not enlarged clinically or as seen at operation or after examination by the pathologist. There may be cases in which the spleen is enlarged temporarily. The presence of thrombocytopenia, increased bleeding time, from twenty to thirty minutes or even ninety minutes or more in rare cases, and a positive capillary resistance test are valuable aids in the diagnosis of essential hemorrhagic purpura. The blood coagulation is practically normal, in marked contrast with hemophilia. Acute, chronic and intermittent forms of essential hemorrhagic purpura are described. The disease should always be looked on as serious. A case that may not appear to endanger the life of the individual may terminate with tragic suddenness. The author has treated five typical cases of essential hemorrhagic purpura, all of which have been cured by splenectomy. As a temporary measure in severe bleeding from hemorrhagic purpura blood transfusion is distinctly valuable, but the good effects are likely to last only for from ten to fourteen days. Neither drugs nor thromboplastic serum are of any real value. Tying the splenic vein has been practiced by some, but, if the causative agent should prove to be a toxic substance present in the spleen, splenectomy is preferable. The usual practice is not to do a splenectomy if the red cells are below 2 million per cubic millimeter and only then after a blood transfusion.

2: 485-526 (Sept. 14) 1935

Hospital Problems. J. Barrett.—p. 485.
Fractures of Neck of Femur. E. W. H. Groves.—p. 491.
Radiographic Diagnosis in Diseases of Lungs. J. G. Edwards.—p. 493.
The Child Guidance Clinic. H. Sutton.—p. 495.
*Wire Extension in Treatment of Mandibular Fractures. R. Brooke. —p. 498.
Laryngeal Granuloma Following Intratracheal Intubation. R. B. Gould. —p. 499.

Wire Extension in Treatment of Mandibular Fractures.—To overcome the eventuality of a displaced position of the lower and upper jaws in mandibular fractures when reduction is impossible because of local edema and sepsis, Brooke has applied the principles in use in the treatment of fractures of the long bones: A Kirschner's wire is passed transversely through the symphysis of the mandible and vertical weight extension is applied by means of pulleys attached to a Balkan frame. The head is held down by webbing straps to the bed. It is found that with this form of treatment the patient experiences great relief from pain and is able to open the mouth much more freely almost at once. Liquid food is given at first, followed later by soft solids. The extension is left on until the local condition in the mouth has improved to such a degree that it is possible to fit a dental splint of the usual pattern. Not only is there great relief from pain but the position of the fractured fragments is greatly improved and alinement is restored.

Indian Medical Gazette, Calcutta

70: 481-540 (Sept.) 1935

Preliminary Report on Epidemic Dropsy Outbreak in Purulia. R. N. Chopra and R. N. Chaudhuri.—p. 481.
Ocular Complications of Epidemic Dropsy. E. O. Kirwan.—p. 485.
Pathology of Epidemic Dropsy. M. N. De and K. D. Chatterjee.—p. 489.
Cutaneous Manifestations of Epidemic Dropsy: Part I. Clinical Study. R. N. Chopra and R. N. Chaudhuri.—p. 493.
Id.: Part II. Histopathologic Study. R. N. Chopra, R. N. Chaudhuri and D. Panja.—p. 496.
Observations on Epidemic Dropsy Cases Admitted into the Tropical Diseases Hospital from 1922 to 1933. R. N. Chopra and S. N. Bhattacharya.—p. 498.
Incidence of Cerebrospinal Fever in Borstal Institution and Central Jail, Lahore, During 1934, with Note on Use of Antimeningococcus Prophylactic Vaccine. M. Yacob.—p. 502.
Short Account of Ten Cases of Eclampsia Treated by Intravenous Injections of Magnesium Sulphate. M. M. Nolan.—p. 503.
Estimation of Minute Quantities of Atabrine in the Blood. R. N. Chopra and A. C. Roy.—p. 504.
Unusual Identification of Explosive. N. J. Vazifdar.—p. 506.

Journal of Pathology and Bacteriology, Edinburgh

41: 221-372 (Sept.) 1935

Pulmonary Artery Thrombosis with Ayerza's Syndrome: Case. G. L. Montgomery.—p. 221.
Experimental Production of Sarcoma in Rats and Mice by Colloidal Aqueous Solution of 1:2:5:6-Dibenzanthracene. E. Boyland and H. Burrows.—p. 231.
*Pathogenic Diphtheroid Bacillus from Fatal Case of Meningitis. H. J. Gibson.—p. 239.
Late Relapses and Apparently Spontaneous Cure of Untreated Relapses in Experimental Trypanosoma Brucei Infections Treated by Chemotherapeutic Agents. C. H. Browning annd R. Gulbransen.—p. 253.
Relation of Oligocytes and Astrocytes in Cerebral Tumors. Eugenia R. A. Cooper.—p. 259.
*Liver Changes in Exophthalmic Goiter. G. R. Cameron and W. A. E. Karunaratne.—p. 267.
Liver Regeneration and Biliary Obstruction. G. R. Cameron.—p. 283.
Mixed Tumors of Palate: Report of Four Cases. L. J. Davis.—p. 289.
Suprarenal in Cholesterol Fed Rabbits. W. W. Kay and R. Whitehead. —p. 293.
Staining of Fat with Sudan IV. W. W. Kay and R. Whitehead.—p. 303.
Involution of Permanent Cortex of Rabbit Suprarenal by Fatty Change. R. Whitehead.—p. 305.
Mitochondrial Changes in Autoplastic Liver Transplants. E. S. Duthie. —p. 311.
Histologic Changes in Organs of Rats Injected with Estrone Alone or Simultaneously with Estrone and Testicular Hormone. V. Korenchevsky and M. Dennison.—p. 323.
*Change in Basophil Cells of Pituitary Gland Common to Conditions Which Exhibit Syndrome Attributed to Basophil Adenoma. A. C. Crooke.—p. 339.
Lympho-Epithelioma of Thymus. T. T. Wu.—p. 351.

Diphtheroid Bacillus from Fatal Case of Meningitis.—Gibson describes a fatal case of meningitis due to an organism resembling that (Corynebacterium parvulum) described by Schultz and his co-workers. The lesions produced appear to have resulted from invasion by a nontoxigenic type of diphtheroid bacillus. A study has been made of its morphologic, cultural and biochemical characters and of its pathogenicity. It is highly virulent for rabbits, guinea-pigs, rats and mice and its effect is not neutralized by the antitoxins of Corynebacterium diphtheriae or Corynebacterium ovis. Efforts to demonstrate an exotoxin have failed and indirect evidence has been presented suggesting that the pathogenic effects are not due to toxic action.

Liver Changes in Exophthalmic Goiter.—Cameron and Karunaratne attempt to show by grouping their thirty cases that a certain proportion of fatal exophthalmic goiter cases (about two out of three) display changes of the liver independently of passive venous congestion. They find it possible to distinguish between cases in which passive venous congestion, usually the result of cardiac failure, is primarily responsible for the pathologic alterations and those in which the changes are independent of stasis. The latter, however, may be complicated by venous congestion. In their thirty cases, ten showed various grades of "nutmeg" liver; of the remaining twenty, six presented some evidence of stasis also. Fatty change has been an almost constant finding (twenty-six cases), and they attach little significance to it. When it is associated with definite necrosis, they regard the resulting condition as evidence of a severe toxemia and in all probability the basis of the more chronic changes, which they have called atrophy and cirrhosis. They consider that the cases with chronic changes of atrophy,

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fibrosis and regeneration form a group in which the frequency of occurrence and the constant pathologic picture must be related causally to the complex of exophthalmic goiter. They recognize three types of change in the liver associated with exophthalmic goiter: (1) cases with acute damage (marked fatty change and/or acute liver necrosis), (2) cases with evidence of progressive damage (various stages of cirrhosis), and (3) arrested cases (nodule formation; atrophy).

Hyaline Change in Basophil Cells of Pituitary.—Crooke discusses a hyaline change in the basophil cells of the pituitary gland that does not appear to be an expression of cell degeneration in the ordinary sense but is probably an expression of altered physiologic activity. It was found in slight amount in a few basophil cells of the anterior lobe in only nine out of some 350 pituitary glands from various conditions in which the syndrome attributed to basophil adenoma was absent. Its presence in examples of the different conditions in which it was thus found was inconstant and exceptional. It was found in large amount in many basophil cells in the acini of the anterior lobe in all twelve available examples of the syndrome attributed to basophil adenoma, whether this was associated with a basophil adenoma, a neoplasm of the thymus or a neoplasm or hyperplasia of the adrenal cortex. Analysis shows that this conspicuous amount of hyaline change was the only abnormality common to all twelve examples of the syndrome, and it is concluded that it is the abnormality of fundamental significance.

Lancet, London

2: 539-592 (Sept. 7) 1935

Chronic Constrictive Pericarditis (Pick's Disease): Treated by Pericardial Resection. P. D. White.—p. 539.
*Observations on Anemia in Chronic Rheumatic Diseases. D. H. Collins.—p. 548.
Simple Ulcer of Large Bowel. R. A. Kerr.—p. 550.
Observations on Chorea: Environmental Factor. G. F. Walker.—p. 553.

Anemia in Chronic Rheumatic Diseases.—Collins has observed twelve patients with chronic rheumatism and a severe or moderate anemia, who were given massive doses of iron and observed for periods up to twenty-one days; seven totally failed to respond and only two showed any marked improvement. Anemia, due to a diminished hemoglobin content of the blood with a relatively insignificant fall in the red cell count, is common among patients having chronic rheumatic conditions. The more severe degrees of anemia are seen almost entirely in cases of atrophic (rheumatoid or "infective") arthritis. Deficient gastric secretion is not a constant factor in the production of anemia in these cases. Anemia of equal severity is encountered in cases with normal fractional test meal curves, as in cases with deficient acid secretion. There is no specific anemia accompanying the chronic rheumatic conditions. The anemia is a simple hypochromic one secondary to the disease process.

2: 593-646 (Sept. 14) 1935

Perforation of Esophagus by Swallowed Foreign Bodies. J. E. G. McGibbon, with radiologic notes by J. H. Mather.—p. 593.
Chronic Constrictive Pericarditis (Pick's Disease) Treated by Pericardial Resection. P. D. White.—p. 597.
Treatment of Obesity. J. H. Anderson.—p. 604.
Observations on Biliary Drainage. T. Hunt.—p. 608.
Agranulocytic Angina: Case. B. J. Boulton.—p. 610.
*Right-Sided Eventration of Diaphragm: Notes on Case. F. G. Nicholas and A. M. Nussbrecher.—p. 611.
*Acetylsalicylic Acid (Aspirin) Poisoning. S. C. Dyke.—p. 613.
Papilledema Caused by Cervical Cord Tumor. D. McAlpine.—p. 614.

Right-Sided Eventration of Diaphragm.—Nicholas and Nussbrecher report a case of right-sided eventration of the diaphragm in the differential diagnosis of which paralysis of the diaphragm, eventration, hernia and absence of the right half of the diaphragm was considered. The negative history and the roentgenographic and clinical observations ruled out the first, and the roentgenogram showing an unbroken dome of the right side of the diaphragm eliminated the third and fourth possibilities. Therefore the diagnosis of right-sided eventration was the only other possibility and it was concluded that it was of congenital origin. The authors warn against indiscriminate needling of the chest in obscure cases, because there is great danger of perforating a viscus unless eventration or hernia of the diaphragm has been eliminated. The condition gives rise to hardly any symptoms, and the likelihood of serious disability in the future appears remote.

Acetylsalicylic Acid Poisoning.—Dyke describes a case of poisoning by acetylsalicylic acid in which the clinical manifestations pointed to a profound disturbance of metabolism and to toxemia with a heavy incidence on the higher nervous centers. In the early stages the extreme hyperpnea was a marked feature. If the hyperpnea had been due to actual liberation of acid radicals from the ingested compound, it might have been supposed that the urine would be strongly acid; but the urinary p_H was found to range from 5.8 to 6.4. Evidence of the widespread nature of the toxemia was afforded by the urine, which showed (in addition to acetone) bile salts, albumin and granular casts, which made it evident that both the liver and the kidneys were damaged severely. Albumin was present at first in large amount and on the fifth day was still present in traces; bile salts remained present in fair amount throughout the period of observation. The temperature ranged from normal to 101 F. during the first four days. No physical signs indicative of inflammation that might account for the pyrexia could be found. The obvious indications for treatment were to correct the dehydration, combat the acidosis and support the liver against further damage. To this end dextrose-containing fluids were pushed in every possible way. The beneficial effect of lumbar puncture was striking; on both occasions on which it was performed it was followed by a sudden and definite improvement in the general condition. The very strong reaction with ferric chloride given on both occasions by the cerebrospinal fluid would indicate the presence in it of large amounts of the drug, and it is reasonable to suppose that benefit was due to removal from contact with the central nervous system of fluid saturated with the noxa. The beneficial effect of drainage of the cerebrospinal fluid in the present case is in conformance with general experience in barbiturate poisoning, in which also the noxa is taken up in large amount by the fluid.

South African Medical Journal, Cape Town

9: 549-584 (Aug. 24) 1935

Heart Pain. E. E. Wood.—p. 551.
Effect of Compulsory Segregation of Lepers in Basutoland. P. D. Strachan.—p. 554.
Eclampsia: I. Incidence and Etiology. A. I. Goldberg.—p. 556.
Id.: II. Eye Changes During Pregnancy, with Especial Reference to Eclampsia. J. S. du Toit.—p. 559.
Id.: III. Treatment of Eclampsia. E. C. Crichton.—p. 560.
Id.: IV. Notes on Eclampsia. A. S. Wells.—p. 562.

Japanese Journal of Gastroenterology, Kyoto

7: 57-114 (July) 1935

Existence of Substances Promoting Liver Function in Blood and Urine: Report II. Urine. N. Mizuta and T. Matsuura.—p. 57.
Quantitative Changes in Enzymes in Liver and in Various Tissues in Case of Impaired Renal Functions. S. Murata.—p. 69.
Significance of Liver for Metabolism of Lactic Acid. I. Ôhashi.—p. 88.
Studies on Metabolism of Inorganic Salts and Water in Hepatic Disturbances: Report III. Metabolism of Inorganic Salts: Perfusion Experiment of Extirpated Liver. H. Shigemi.—p. 104.
Id.: Report IV. Metabolism of Water. H. Shigemi.—p. 111.

Journal of Oriental Medicine, Dairen, South Manchuria

23: 9-20 (Aug.) 1935

Origin of Parietal Branches of Aorta in Chinese. K. Miyashita.—p. 9.
Biochemical Investigation on Blood Serum After Irradiation with Artificial Light: V. Colloid Reaction in Blood Serum After Irradiation with Artificial Light. M. Murayama.—p. 11.
Prophylactic Inhalation Against Scarlet Fever in Adults. G. Ishiyama.—p. 12.
Studies on Scarlet Fever Toxin: III. Purification of Scarlet Fever Toxin and Anatoxin: Toxin Production of Scarlet Fever Streptococcus in Semisynthetic Mediums. S. Nagata.—p. 13.
Effect of Ethereal Oil of Allium Scorodoprasum on Blood Picture. T. Miyamoto.—p. 14.
Relationship Between Digestive Absorption and Diet of Unpolished Rice. A. Abe, U. Takei, O. Ueno, T. Miyamoto and F. Etô.—p. 15.
Comparative Studies of Arteriosclerosis Caused by Test Feedings of Two Kinds of Thyroid Gland Substances. Kan-Jin-Nan.—p. 16.
Influence of Blood Transfusion on Function of Reticular Endothelial System. M. Okamoto.—p. 17.
Effect of Formaldehyde on Serum Protein. A. Abiko.—p. 18.
Effect of Formaldehyde on Egg Albumin. A. Abiko.—p. 19.
Effect of Formaldehyde on Toxicity of Histamine, Peptone and Ammonium Salts. A. Abiko.—p. 20.

Lyon Chirurgical

32: 513-639 (Sept.-Oct.) 1935

*Cystic Disease and Its Treatment by Estrogenic Substance. E. Dahl-Iversen.—p. 513.
Complications of Adrenalectomies. Arkannikowa.—p. 547.
Evolution of Sacral Methods in Operation for Rectal Cancer. F. Mandl. —p. 566.

Treatment of Cystic Mastitis by Estrogenic Substance.—Dahl-Iversen states that the characteristic sign of cystic mastopathy is the appearance of cysts of the galactophore canals and lobules; all the new growths are irregular, and the pericanalicular and periacinous connective tissues proliferate considerably and become the site of a round cell infiltration. A number of theories have been advanced to explain these changes, among them that the primary factor is a dystrophy or senile regression of hormone secretion. The author observed the effects of ovarian hormones on the breasts of noncastrated rabbits and of infant and adult female guinea-pigs. Both estrogenic substance and lutein were used in the injections. Several results were common to the two substances. The hormones caused only a physiologic hyperplasia when administered in large quantities. The glandular system dilated uniformly and to a greater degree after the administration of lutein. The lumens were filled with a homogeneous eosinophile secretion. The epithelium kept its normal aspect and neither atrophied nor proliferated toward the lumen. Neither the pericanalicular nor the periacinous connective tissues proliferated. Dahl-Iversen concludes as a result of these observations on fifty-four animals and thirty-three controls that no changes comparable to cystic mastopathy result from the administration of estrogenic substance or lutein. There is incontestable evidence, however, that estrogenic substance often has a favorable subjective as well as objective effect in human cystic mastopathy. The action on the diseased breast, therefore, seems to differ from that in the normal animal.

Schweizerische medizinische Wochenschrift, Basel

65: 937-956 (Sept. 28) 1935. Partial Index

Surgery and Radiations in Treatment of Cancers. H. Hartmann.—p. 937.
Physical Therapy at Swiss Lakes. P. M. Besse.—p. 942.
Experimental Studies on Biologic Action of So-Called Earth Rays. E. Jenny, A. Oehler and H. Stauffer.—p. 947.
New Alkaloid of Ergot. E. Rothlin.—p. 947.
*Comparison Between Micromethod and Macromethod of Sedimentation of Erythrocytes. O. Merkelbach.—p. 949.

Sedimentation of Erythrocytes.—Merkelbach points out that the question is often asked whether a micromethod gives just as reliable results as the macromethod in the determination of the sedimentation speed of the erythrocytes. The micromethod has the advantage of making a venous puncture unnecessary. The author made comparative tests with the Westergren method and the micromethod of Langer. On the basis of observations on 256 patients, the author reaches the conclusion that the micromethod of Langer cannot be the method of choice for the determination of the sedimentation speed of erythrocytes, for its results differ too greatly from those obtained with the Westergren method. The author considers a greater uniformity advisable in the determination of the sedimentation speed of erythrocytes and for this reason advises adoption of the Westergren method as the standard method.

Policlinico, Rome

42: 1943-1986 (Oct. 7) 1935. Practical Section

*Cycle of Development of Oxyuris in Intestine of Man. G. Penso.—p. 1943.
Cyst of Mesentery. Case. G. Muzzarelli.—p. 1950.

Life Cycle of Oxyuris in Man.—Penso calls attention to the importance of the life cycle of Oxyuris, which passes the adult and coupling phases of its life in the lumen of the intestine. The females, after coupling, perforate the intestine and pass from the lumen to the submucous membrane of the intestinal walls. There they lay eggs, the larvae of which, after development, perforate the intestinal wall and pass from the submucous membrane to the lumen of the intestine for repetition of the same cycle. The biologic cycle of Oxyuris lasts twenty days. The author proves that there is no auto-infestation by Oxyuris. The persistence of the infestation and the difficulties of the treatment are due to the duration of the biologic cycle, on the one hand, and to the fact that anthelmintics kill the parasites in the lumen of the intestine but cannot act on those lodged in the submucous membrane of the intestine, on the other. The author believes that good results might be secured by administering anthelmintic drugs for three consecutive days, at intervals of twenty days. However, because of the possibility that different groups of Oxyuris might have their cycles between the intervals, it would be preferable to find a drug, perhaps an antimonial preparation, which, given parenterally, would have a parasitic action on the parasites lodged both in the lumen of the intestine and in the intestinal walls.

Prensa Médica Argentina, Buenos Aires

22: 1753-1798 (Sept. 11) 1935

Indications of Rectal and Vaginal Touch in Obstetrics. O. Jürgens. —p. 1753.
*New Maneuver for Abdominal Examination. G. A. Mortola.—p. 1760.
Rare Vertebral Congenital Abnormality, Vertebral Telescopage: Roentgen and Clinical Study. J. R. Abdala.—p. 1765.
Anatomoclinical Forms of Pulmonary Syphilis in Adults. D. Vivoli.—p. 1770.

New Maneuver for Abdominal Examination.—Mortola describes a maneuver for abdominal examination that consists in slipping the parietal layer of the peritoneum over the visceral layer by the following technic: The patient is in the dorsal decubitus with the abdominal muscles relaxed. The physician takes between the thumbs and index fingers of both hands a large fold of the anterior abdominal wall at the lower right and left quadrants to discover any cutaneous hyperesthesia and then exercises traction on the cutaneous folds. When the parietal layer slips over the visceral layer in the pathologic zone an intense pain is produced. The positive results are of value in the diagnosis of chronic conditions of the abdomen, especially in chronic appendicitis. In these cases it coexists with a positive McBurney sign. The maneuver gives also positive results in acute appendicitis and in tuberculous peritonitis without ascites. The fact that the reaction is positive in many cases after appendectomy and becomes negative when the peritoneal inflammation subsides proves that the reaction is not appendicular but peritoneal. The intensity of the reaction is related to the peritoneal inflammatory process. In all cases in which the maneuver provoked pain in one or both sides of the abdominal surface, unilateral or bilateral lesions of the peritoneum were found at operation. The author performed the maneuver in about 130 cases, in twenty-seven of which operation was performed.

Archiv für klinische Chirurgie, Berlin

182: 459-648 (Aug. 26) 1935. Partial Index

*Substitutes for Blood. Konrich.—p. 459.
Experimental Studies on Behavior of Cerebral Pressure in Fat Embolism. Frey.—p. 581.
*Is Severing of Connecting Bridge of Healthy Horseshoe Kidney a Justifiable Intervention? R. Chwalla.—p. 590.
Experiences with Physiologic Tendon Transplantation on Feet in Poliomyelitis. F. Mommsen.—p. 599.

Substitutes for Blood.—Konrich points out that in severe acute loss of blood the best treatment is blood transfusion. However, blood transfusion involves a number of factors, such as suitable donors, tests and instruments, the smooth collaboration of which may be impossible in rural regions or in certain emergencies. It would be desirable to find a suitable substitute for blood, which could be kept in readiness like other injection fluids. The author made tests on 360 rabbits, employing simple bleeding as well as the so-called washout experiment. He made comparative tests with physiologic solution of sodium chloride, a dry and a fluid preparation which, in their composition, correspond to the blood salts, and Tyrode's solution and serum. It was found that the quantity of blood the loss of which is fatal varies greatly; namely, between 1.57 and 4.63 per cent of the body weight. The isotonic solution of sodium chloride was found to be inferior to all other fluids that were tried. The solutions of the blood salts were more favorable, but even their efficacy was considerably inferior to that of serum. The efficacy of all solutions could be noticeably increased by adding to them rabbit erythrocytes removed from the serum. Death from loss of blood is not primarily due to heart failure but to failure of the respiration. The inadequate filling of the vascular system

is not the cause of death, at least not the chief cause. Death is caused not so much by a deficiency of erythrocytes as by a deficiency in serum.

Severing the Connecting Bridge of Horseshoe Kidney.—Chwalla describes two cases of horseshoe kidney in which he performed discission of the isthmus more than ten years ago. In these two cases all symptoms of the horseshoe kidney were absent ten and fourteen years after the operation. He thinks that this proves the suitability of the intervention. His two patients were women.

Deutsche medizinische Wochenschrift, Leipzig

61: 1503-1542 (Sept. 20) 1935. Partial Index

Focal Infection. H. A. Gins.—p. 1503.
*Clinical Studies on Action of Histidine Therapy in Gastroduodenal Ulcers. E.-E. Bauke.—p. 1510.
New "Short-Term" Application of Short Waves in Medical Practice. W. Huneke.—p. 1514.
Treatment of Pruritus. G. Schäfer.—p. 1517.

Histidine Therapy in Gastroduodenal Ulcer.—Bauke says that, on the basis of observations in forty-six cases, he is able to corroborate the favorable results that others obtained with histidine in the treatment of gastro-intestinal ulcers. He emphasizes that the selection of the cases is highly important, because histidine monohydrochloride produces the best results in new gastro-intestinal ulcers, whereas it produces as a rule only symptomatic effects in the chronic relapsing forms. The dosage must be individualized. The number of injections varies between eighteen and twenty-five. The administration of histidine in tablet form is much less effective than the parenteral administration, and the combination of oral and parenteral medication increases the action only slightly. Cure is indicated by disappearance of the subjective symptoms, of the traces of occult bleeding and of the roentgenologic signs of niche formation and by the increase in weight. The incidence of roentgenologically demonstrable cicatrization is higher after treatment with histidine monohydrochloride than after the formerly customary therapeutic methods. The average increase in weight is from 4 to 7 Kg. The gastric secretion and motility are not influenced by the histidine treatment. The author recommends the therapy for use on a larger material.

61: 1543-1582 (Sept. 27) 1935

*Significance of Intravital Examination of Bone Marrow for Clinicohematologic Diagnosis. N. Henning.—p. 1543.
Special Forms of Gastrogenic Anemia. K. Wotzka.—p. 1548.
Essential Hypochromic Anemia. K. Jensen.—p. 1550.
*Comparison of Thrombocyte Counts According to Fonio and Jürgens. F. Gerloff.—p. 1557.

Intravital Examination of Bone Marrow.—Henning, in collaboration with Korth, devised a new method for the withdrawal of bone marrow, a diagnostic sternal irrigation. Following anesthetization of the skin and of the periosteum, the cannula, attached to a record syringe containing 0.5 cc. of the irrigation fluid, is pushed vertically into the sternum. After trying different types of trocars, the authors found that a beveled hollow needle is more effective for the perforation of the bone. After the medullary cavity has been reached, irrigation is begun. The plunger of the syringe is pressed downward, which proves easy if the needle is in the correct position. As the result of the increased pressure in the medullary space, the patient feels a pain. The fluid is forced out and this is immediately followed by aspiration. A fluid having the appearance of leukemic blood appears in the syringe. The cannula is removed and the site of puncture is covered by a sterile plaster. Preparations are made as in the case of blood smears. The authors used in each case May-Grünwald, Giemsa and peroxydase stains. The advantages of this method are that the cannula is simpler because it works without a mandrin; there is no time lost in changing the mandrin and attaching the point; the hollow needle penetrates the bone readily; the readiness with which the irrigation fluid enters indicates the correct position of the instrument; the irrigation tears off a sufficient mass of cells so that the puncture fluid appears in the syringe immediately following the aspiration, and, since the irrigating fluid contains anticoagulating substances (finally a solution of sodium citrate was used), it is unnecessary to be hasty. The author emphasizes that this method is not only more simple but also more rapid than the method of Arinkin. After describing the cell morphology of the normal bone marrow, he reports the aspects of the bone marrow in the various blood diseases. He performed approximately 200 punctures and only once failed to obtain marrow. He hopes that the intravital examination of the bone marrow will soon acquire a place beside the cytologic examination of the blood. The systematic comparison between the site of blood formation and the peripheral blood will be a great help to pathologic physiology, diagnosis, therapy and prognosis.

Thrombocyte Counts.—Gerloff points out that the literature reports more than fifty different methods for the determination of the number of thrombocytes. At present the method of Fonio is most widely used. However, this method does not reveal the correct number of thrombocytes. The author's comparative tests with Fonio's method and the one described by Jürgens disclosed that the values obtained with these methods stand in a ratio of about 1 : 2.76, the method of Jürgens giving the higher numbers. He found that the lower numbers detected with the method of Fonio are due to the fact that a large percentage of thrombocytes are destroyed. He shows that the method of Jürgens is a simple and exact method in which the destructive influences are limited to a minimum.

Deutsche Zeitschrift für Chirurgie, Berlin

245: 333-436 (Aug. 28) 1935. Partial Index

Esophageal Peptic Ulcer. W. Roessler.—p. 333.
*Use of So-Called Universal Donor in Blood Transfusion. E. Hesse.—p. 371.
Intra-Abdominal Displacement of Testes and Malignant Degeneration. E. Heinicke.—p. 383.
*Experiments on Function of Greater Omentum. H. Ueda and W. Mabuchi.—p. 390.
Significance of Determination of Rest Nitrogen for Clinic of Acute Pancreatic Disturbances. F. Bernhard.—p. 398.

Universal Donor in Blood Transfusion.—Hesse says that until recently it was generally asserted that persons in blood group O are universal donors. A number of authors even suggested that in time of war only blood of group O should be used, so as to make the determination of blood groups unnecessary. The author asserts that recently there has been an increase in the number of cases in which hemolysis followed the transfusion of blood from a universal donor into a patient with another blood group. He found forty-six cases reported in the literature, twenty of which were fatal. He emphasizes that the transfusion of large amounts of blood (more than 200 cc.) may lead to "retrogressive" agglutination and hemolysis, particularly if the titer of the donor's serum is too high compared to the erythrocytes of the recipient. Investigations were made on the titers of 104 universal donors. In more than 42 per cent the titer exceeded 1 : 32 with the erythrocytes of group A, and in more than 32 per cent it exceeded 1 : 32 with the erythrocytes of group B. The author says that such a titer already involves danger of "retrogressive" agglutination. In fourteen cases the titer was 1 : 128 and in three cases 1 : 256. The transfusion of blood from a universal donor with a titer of 1 : 16 causes no symptoms. However, in cases in which the titer was high or of moderate height, signs of hemolytic shock appeared. In the case of transfusion of blood of the same group, the clinical observations disclosed no deviations from the normal, whereas the transfusion of blood from a universal donor produced considerable increases in the pulse frequency (up to forty beats). This indicates that the nervous system is extremely sensitive toward discrepancies in the blood groups. The transfusion of blood from universal donors is especially dangerous if the recipient belongs to group A, for fifteen of twenty-two cases of hemolytic shock were of this group. The author reaches the conclusion that there are no universal donors in the strict sense of the term and that transfusions should be made only within the same blood group. If in case of emergency a universal donor has to be used, not more than 200 cc. should be given and even then the transfusion is permissible only if the erythrocyte count of the recipient has not gone below two million and the titer of the donor's serum with the erythrocytes of the recipient does not exceed 1 : 16. Of course, if it is a question of life and death and only a universal donor is available, the lesser of two evils should be chosen and transfusion tried.

Function of Greater Omentum.—To obtain information about the function of the greater omentum, Ueda and Mabuchi studied the effect of its extirpation on the organism of animals.

First they made histologic studies to determine the changes in the abdominal organs following extirpation of the omentum. Quite early they found degenerative changes of different degrees in the liver, spleen, kidney, mesenterial lymph nodes and stomach. Later they observed enlargement and proliferation of the histiocytes in the liver, spleen and mesenterial lymph nodes which they consider vicarious manifestations of the reticulo-endothelial system. They describe serologic studies in which they observed that rabbits without omentum have a higher mortality following the injection of bacterial toxins than normal rabbits. Other studies were concerned with the effects of the extirpation of the greater omentum on the iron metabolism of the various organs and on the blood. The authors gained the impression that the omentum is a sort of protective apparatus against toxic substances and exerts a regulating influence on the iron metabolism. The second part of the report is concerned with experiments on the function of the greater omentum in the metabolic processes. It was observed that in rabbits the removal of the greater omentum influences the metabolism of the carbohydrates, of the protein bodies and of the fat and lipoid substances. The metabolic changes that develop following removal of the spleen differ in their pathogenesis from those produced by the total extirpation of the greater omentum. The omental extirpation causes a certain fluctuation in the liver glycogen. The weight decreases gradually and usually fluctuates in proportion to the glycogen content of the liver.

Klinische Wochenschrift, Berlin

14: 1345-1376 (Sept. 21) 1935. Partial Index

Studies on Hormones in Cushing's Disease. A. Jores.—p. 1348.
Traumatic Origin of Inflammatory Diseases of Nerves. P. Matzdorff. —p. 1351.
*Human Milk as Hemostatic. A. Solé.—p. 1354.
Sodium Chloride Therapy in Addison's Disease. S. Siwe.—p. 1359.
Iodine Metabolism in Persons with Goiter. L. Scheffer and L. von Megay.—p. 1360.

Human Milk as Hemostatic.—Solé gives a summary report of the hemostatic action of human milk, which he discovered in 1931. Human milk surpasses all other hemostatics in vitro as well as in the patient. However, colostrum is ineffective and the hemostatic action develops completely between the fourteenth and the thirtieth day of lactation, but after that it remains practically the same throughout the period of lactation. Only the milk of entirely healthy women (without febrile diseases) should be used. Human milk was found to accelerate the coagulability of animal bloods. The principle in human milk which effects the acceleration of the coagulation adheres to the suspended fat particles and can be separated from the milk by centrifugation. This principle is not soluble in alcohol, ether or acetone. The author describes a method for the preparation of a powder, which contains chiefly the coagulating principle and from which aqueous suspensions can be prepared. He discusses the properties, the nature and the purpose of the coagulating principle in human milk. Human milk has a hemostatic effect only when applied locally, whereas enteral or parenteral (intramuscular) administration has no effect on the coagulation of the blood. The author applies the milk by means of iodoform tampons that have been saturated with it. The practical results of the local application of human milk are demonstrated on the basis of the case histories of hemophilic patients (operations and injuries). In such cases and in thrombopenic hemorrhages it produced favorable results.

14: 1377-1416 (Sept. 28) 1935. Partial Index

*Behavior of Diastolic Venous Pulse Wave in Tachycardia. B. Misske. —p. 1381.
Influence of Ultraviolet Irradiations on Carbohydrate Metabolism. A. Marchionini and C. Hövelborn.—p. 1387.
*Modification of Antigen (Horse Serum) by Ultraviolet Irradiation. P. Kallós and Liselotte Kallós-Deffner.—p. 1392.
New Pancreatic Substitution Preparation with Greater Lipatic Action. L. Vogel and P. Laeverenz.—p. 1393.

Diastolic Venous Pulse Wave in Tachycardia.—Misske shows that in the venous pulse curve there appears, in addition to the a wave, indicative of an auricular contraction, and the x wave, as a manifestation of the filling of the right auricle during the ventricular contraction, a third elevation (d), which Wenckebach designated as the systolic-diastolic marginal wave, or simply marginal wave, because it marks the boundary between the evacuation and the filling of the ventricle. The author explains the development of this third wave and shows that it is of especial diagnostic value. He made investigations which convinced him that the behavior of the d wave in tachycardia is determined by the beat frequency but that the changes or deviations in the d wave are not always the same in cases of equal pulse frequencies without it being possible to find a definite reason for this. Up to a pulse rate of 106 the d wave shows no great changes, for these appear only in case of higher frequencies. They can be classified into three groups. In the first group there may be considerable flattening up to complete disappearance. In the second group, d is indicated only in the lower course of the systolic declivity, or it is indicated by a break-off and to a certain extent it appears as the prolongation of the systolic slope. In both groups d is immediately followed by the auricular a wave. In the third group d is prematurely interrupted by the subsequent a wave, or its peak or its ascending branch blends wavelike with the subsequent a wave. That in a case of identical pulse frequencies, the deviations of the d wave may differ was observed in two cases with frequencies of 131. In one of these it was indicated as a breakoff at the foot of the systolic slope, whereas in the other it appeared as a shallow wave, and in a case with a frequency of 129 it was elevated and blended with the subsequent a wave. The author describes several characteristic venous pulse curves in tachycardia. One illustration depicts the curve of the venous pulse in exophthalmic goiter. Another outlines the venous pulse in tachycardia caused by endocarditis and in which the diastolic wave was missing. A third shows blending of the diastolic wave with the subsequent presystolic wave in a case of exophthalmic goiter (caused by iodine) with a pulse frequency of 140, a prolonged transmission time (PQ 0.22 second) and a basal metabolic rate of 83.3 per cent, and a fourth shows the venous pulse curve of the same patient when the pulse frequency was 120, the PQ 0.21 second and the basal metabolic rate 50 per cent. That the deviations of the diastolic wave are caused entirely by the accelerated heart action is proved by the observation that it becomes more and more shallow with increasing cardiac frequency and is only indicated or disappears entirely in frequencies of 150 and more.

Modification of Horse Serum by Ultraviolet Irradiation.—Kallós and Kallós-Deffner point out that studies by Pick and by Landsteiner disclosed that relatively slight changes in the chemical structure of antigens produce considerable changes in their biologic properties. They describe their own studies conducted to determine what effect irradiations with ultraviolet rays have on the immunobiologic properties of a protein antigen. They found that intensive ultraviolet irradiation, lasting at least twenty minutes, is capable of counteracting the shock producing action of horse serum, while the neutralization capacity for specific antibodies is retained.

Zeitschrift für Tuberkulose, Leipzig

73: 321-456 (Sept.) 1935

Annual Report of Tuberculosis Welfare Station in Jena. J. E. Kayser-Petersen.—p. 321.
*Significance of Early and Regular Examinations for Pathogenesis and Course of Cases of Tuberculosis in Families of Patients with Open Tuberculosis. Y.-P. Liu.—p. 334.
Aspects of Tuberculosis in Rural Districts. R. Hess.—p. 349.
Protective Confinement of Asocial and Antisocial Tuberculous Patients. A. Rössler.—p. 358.

Tuberculosis Contacts.—On the basis of 1,000 cases that were under observation in the welfare station for tuberculous patients in Jena, Liu demonstrates: 1. The importance of early examination of the persons who are in contact with a patient who has open tuberculosis. Tabular reports indicate that, if these examinations are made early, 0.72 per cent of these persons are found to have an infectious tuberculosis, whereas, if these examinations are postponed, their number amounts to 19.4 per cent. 2. The importance of regular examinations. Comparative tables indicate that, in case of regular after examinations, 2 per cent contract an infectious tuberculosis and 3 per cent of these terminate fatally. However, if the examinations are not made regularly, 16 per cent are found to develop infectious tuberculosis and 9 per cent of these end in death.

Zentralblatt für Gynäkologie, Leipzig

59: 2289-2336 (Sept. 28) 1935. Partial Index

Relations Between Cohabitation and Pregnancy in Young Girls and Physiologic Follicle Cycle Indicated Thereby. F. von Mikulicz-Radecki and Eva Kausch.—p. 2290.
Tubal Deformities and Tubal Sterilization. B. Ottow.—p. 2302.
*Experiences with Chemical Diagnosis of Pregnancy According to Kapeller-Adler (Demonstration of Histidine in Urine). K. Stern.—p. 2305.

Diagnosis of Pregnancy by Demonstration of Histidine in Urine.—Stern stresses the comparatively small number of erroneous results (5.6 per cent) in the urines of nonpregnant women, but he concedes that the test gives from 15 to 20 per cent of negative results during the early period of pregnancy. From this he concludes that the positive reactions are more convincing than the negative reactions. In the more advanced stages of pregnancy, during which, to be sure, the laboratory methods of diagnosis are much less important, the reaction has a reliability of 94 per cent. But in spite of the fact that the chemical diagnosis of pregnancy by means of the demonstration of histidinuria does not attain the same degree of correctness as the Aschheim-Zondek reaction, the author does not want to reject it. He thinks that it should be used as a preliminary test because of its simplicity, inexpensiveness and rapidity, the positive outcome in connection with the clinical test making the existence of a pregnancy highly probable, whereas the negative test could be controlled by an Aschheim-Zondek test.

Hospitalstidende, Copenhagen

78: 889-916 (Aug. 27) 1935

*Further Experiences with Treatment of Hematemesis and Melena with Food. A. Rischel.—p. 889.
Is Creatinine Clearance Expression of Filtration Through Glomeruli? (Studies on Elimination of Sugar and Urea.) P. Iversen and T. Bjering.—p. 903.
Retroposition of Colon and Common Ileocolic Mesentery with Torsion: Case. K. M. Andersen.—p. 911.

Treatment of Hematemesis and Melena with Food.—Rischel says that, in 220 of Meulengracht's 256 cases of hematemesis and melena in which food was used for the treatment, the hemorrhage is ascribed to ulcerations or erosions in the intestinal tract. The mortality was about 1 per cent. Among the 206 patients in whom treatment was given up to 1935, 112 had hematemesis, ninety-four of whom had melena, and ninety-four had melena; among 192 patients, 144 were men. There were values of pathologic secretion in about 28 per cent of the cases with positive roentgenograms and in about 6 per cent of those with negative pictures. Definite roentgenologic signs of gastric or duodenal ulcer were present in about 30 per cent and doubtful signs in about 33 per cent. In a number of the remaining 37 per cent with negative roentgen results there had been constant dyspepsia of more than a year's duration directly before the hemorrhage. History of dyspeptic disorders of more than ten years' standing occurred as often in the cases with negative roentgen results as in those with a positive picture, suggesting the possibility of chronic ulcer in spite of the negative results. The author says that, in addition to the more rapid restitution and blood regeneration in the patients treated according to Meulengracht than in those treated with inanition and to the reduced length of time of rest in bed, greater frequency of defecation and less tendency to constipation were noted; 175 patients were discharged without dyspepsia after an exclusive purée diet. Perforation after hemorrhage occurred in only two cases, one being a case of peptic jejunal ulcer. Blood transfusion is advised in cases of a threatening anemic condition.

78: 917-944 (Sept. 3) 1935

*Profuse Renal Hemorrhage, with Especial Regard to Cause and Treatment of Obscure Renal Hemorrhages. O. Mikkelsen.—p. 917.
Clinical Observations on Effect of Intravenous Injections of a 25 per cent Solution of Pyridine Betacarbonic Acid Diethylamide. T. Dalsgaard-Nielsen.—p. 933.

78: 945-972 (Sept. 10) 1935

*Profuse Renal Hemorrhage, with Especial Regard to Cause and Treatment of Obscure Renal Hemorrhages. O. Mikkelsen.—p. 945.
Umbilical Endometriosis: Case. E. Tølbøll.—p. 963.

Renal Hemorrhage.—Mikkelsen mentions trauma, cystic kidney, floating kidney and hydronephrosis as conditions that may lead to vague renal hemorrhage and reviews the causes of profuse, continued or intermittent hematuria with or without pain and without other symptoms, or the so-called essential hematuria, classifying them on the basis of the literature as (1) histologically demonstrable changes in parenchyma, calices, papilli and pelvis, and (2) without histologic changes, disturbances of innervation or blood supply, or hemorrhagic diathesis. The largest reported number of cases of nephrectomy in obscure hematuria show nephritic changes as the cause of the bleeding. Only five cases of hypernephroma are reported. The author says that immediate nephrectomy is indicated in cases of fulminant hemorrhage if the bleeding is assuredly unilateral. In other cases the treatment is partly symptomatic, partly directed to the assumed underlying cause. Treatment is symptomatic in the rare cases of obscure bilateral hemorrhage. Expectant treatment is advised in unilateral hematuria; if the bleeding does not stop spontaneously, symptomatic treatment should be given, possibly medical treatment, as the hemorrhage often depends on focal nephritis. On recurrence, instillation of silver nitrate in the pelvis may be tried. Protein therapy is sometimes effective. The effect of roentgen treatment is doubtful. Usually only the milder hemorrhages are affected by bloodless treatment. With continued or recurring hematuria decapsulation should be considered, which is effective in most cases of nephritic hemorrhages. If hematuria recurs in spite of decapsulation, nephrectomy is indicated, provided the hemorrhage is surely unilateral.

78: 973-1000 (Sept. 17) 1935

*Retroperitoneal Hematomas. C. C. Fleischer-Hansen.—p. 973.
*Treatment of Anuria with Intravenous Infusion of Hypertonic Sodium Sulphate Solution. J. E. Holst.—p. 989.
Acute Delirium. K. Hermann.—p. 994.

Retroperitoneal Hematomas.—Fleischer-Hansen reports a case of partially calcified perirenal hematoma in which the intumescence, originated after trauma, endured for twenty-five years without special symptoms. Renal function and urine were normal and the pyelogram showed slight changes. Treatment of a traumatic hematoma as such, he says, is usually not indicated, but the true hematoma without other simultaneous abdominal lesions may become so large that extraperitoneal excision is called for. Complicated organic lesions immediatetly after the trauma and possible infection of the hematoma somewhat later call for surgical treatment. Operation may be indicated later, often after years, because of cyst formation, pseudohydronephrosis, calcification, deficient resorption or other complications. The "spontaneous" nontraumatic hematomas are found in the kidney region even more often than the traumatic, and, while not common, are well known. In the reported case of unilateral adrenal hemorrhage the patient was admitted eight days after sudden onset of violent pain in the left renal region with subsequent daily attacks of less intense pain. Operation was contraindicated by the patient's extreme exhaustion. Necropsy revealed an intumescence the size of a man's head, consisting of coagulated blood, in which was found the normal left kidney. Remnants of the left adrenal appeared to be in the upper pole of the hematoma. Cirrhosis of the liver and arteriosclerosis of the coronary artery were found.. The hematoma is thought to have originated at the time of the first grave attack. A diagnosis of perirenal hemorrhage is rarely made, the cases being generally regarded as renal tumor, perirenal abscess or ileus. Treatment should consist of lumbar incision, drainage of the hematoma and possibly nephrectomy. All graver cases have been fatal when treated conservatively. The reported mortality is about 60 per cent. Better prognosis depends on diagnosis.

Treatment of Anuria with Sodium Sulphate Solution.—Holst states that, while the anuria in the two reported cases followed an attack of kidney colic and might perhaps be described as a "reflective anuria," there was considerable impairment of the kidney function with hyposthenuria and, especially in the second case, renal insufficiency is believed to have existed for a longer period. Treatment with sodium sulphate resulted in rapid improvement.

CORRECTION

Escherichia Instead of Endamoeba.—In the Current Medical Literature in THE JOURNAL, October 26, page 1381, throughout the title and abstract of the article by Gehm and Huekelekian, the word Endamoeba should read Escherichia.